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# OUR DAY

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A RECORD & REVIEW *of* CURRENT THOUGHT AND ACTION

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THE PRECURSORS OF THE PHILIPPINE REVOLUTION

I. EMILIO AGUINALDO. II. JOSE RIZAL, novelist, poet and philosopher, executed in 1897. III. MARCELO H. DELPILAR, politician and statist, died in 1896.
IV. GRACIANO LOPEZ JAENA, orator and man of letters, died in 1895. V. REV. FATHER JOSE BURGOS, canonist and writer, executed in 1873.
VI. JOSE PAGANIBAN man of letters, died in 1895.

# COMMENTS ON AGUINALDO'S CAPTURE

By ERNEST HOWARD CROSBY

[Mr. Crosby is the son of Rev. Howard Crosby, and one of the foremost social reformers of the United States. He is said to be a disciple of Count Tolstoy. The following is a portion of an article written for The New York Independent.]

GENERAL FUNSTON'S exploit in capturing Aguinaldo has met with a good deal of adverse criticism. It is notable that the defenders of General Funston have as a rule appealed to the soldier's code of honor as being less stringent than that which applies to ordinary people. A prominent New York daily newspaper goes so far as to say explicitly that actions disgraceful in a private individual may be glorious in a soldier. This line of argument is of itself a little startling. We have been told for so many centuries that the soldier is the very custodian of honor that it sounds almost blasphemous to assert that his idea of honor is lower than ours. Forgery, deception, the violation of the laws of hospitality, the use of a man's bread and salt to his own destruction, the cultivation and reward of the basest treachery in our human tools and the wanton slaughter of troops drawn up under false representations of peaceful intention, all these things, we are assured, are manly in the eyes of a soldier, and hereafter we are to look in the military man for the qualities which distinguish the forger, the counterfeiter, the bunco-steerer and the green-goods man. When we think of a Brigadier-General henceforth we must try to picture to our minds a sort of glorified Tombs-police-court detective. It is going to be hard work for some of us whose intellects are of a hopelessly civilian cast; but let us make the effort, or else we shall be left far behind in the march of national development along which the President is leading us.

The Funston episode is only a single event pointing out the general nature of the change in the idea of manliness to which we must readjust ourselves, but it covers by no means the whole of the field. As a nation of mere tradesmen and farmers we have never assimilated the ideals of honor, manliness and glory which distinguish the military peoples. The spirit of West Point and Annapolis has never penetrated into our blood, and the lessons taught there have been too much like voices crying in the wilderness. It is not too late, however. Let us give heed to them now. The Congressional Committee which examined into the question of hazing at the Military Academy disclosed some customs among our embryo army officers which the lay mind found it difficult to grasp. The West Point conception of a fight, for instance, is to pick out a raw, untutored "plebe" who scarcely knows his right hand from his left, and stand him up against the best boxer in the corps, and let him take his punishment until he is knocked senseless. Clearly this is a part of the new standard of manliness which we must perforce adopt. The old civilian injunction to "take a feller of your size," is the relic of a bygone era, fit, perhaps, for prize fighters and such low folk, but altogether unworthy of an officer and a gentleman. We see in the great Powers of the world an exemplification of the strict application of the new rule. Does any truly military nation ever tackle a nation of its size. Of course not. Little Greece may do such a foolish and unsoldierly thing, but did not the first soldier of the world, the German Emperor, turn up his nose when he visited Athens some years ago because the Greeks had practically no standing army? Nations of peasants like the Boers, savages like the Filipinos, may try conclusions with powers their equals or superiors in strength, but a Great Military Power? Never! They pass their time in searching the ends of the earth for little peoples to massacre and rob, and in making abject apologies to each other for every unintentional discourtesy. This is a part of the new ideal of manliness, which, with the spread of a diet of tabasco sauce, will undoubtedly become national. That the public are already well advanced in this direction both in England and America was shown by the wild rejoicings in the one country over the capture of four thousand farmers by 40,000 picked troops, and in the other by the delirious reception accorded to an admiral who sank a few water-logged Spanish ships without losing a man. "Take a feller of your size?" No, indeed. The new military maxim is, "Take the smallest kid you can find!"

The new ideal of manliness involves a high degree of sensitiveness. This explains the jealousies prevalent in the military and naval professions. Did Admiral Jones or Admiral Smith win the battle of San Pedro? Is the Commander-in-Chief on speaking terms with the Adjutant-General? Who is going to be promoted over whose head? Who will succeed in legislating somebody else out of office or on the retired list? These are the questions which harry the military mind. And in England we see the same thing. Lord Lansdowne, the Secretary of War, and Lord Wolseley, the late Commander-in-Chief, attacking each other publicly in the House of Lords, while a British officer writing to the London Times (November 20th, 1900), ascribes the wretched performances of the British army in South Africa to the "petty jealousies" of the generals. No other profession, except that of the actress, can compete with the army and navy in feline amenities. We used to think such behavior effeminate. It is a mistake. Such behavior is manly.

There is another false conception which we must get rid of before we can appreciate the new manliness, and that is the ancient belief in freedom and independence which prevailed before the recent repeal of the Declaration. Absolute obedience, readiness to obey orders, to do anything, these are necessary military qualities. Our admiral at Samoa illustrated this feature when, in answer to the question what he thought of expansion, he answered proudly, "I do not think. I obey orders!" The great War-Lord of Germany emphasizes the truth every year when the recruits are sworn in at Berlin. "Now, my children," he is accustomed to say, "you have sworn to obey my commands, and even if I should order you to fire upon your parents and children you are bound to obey me. I am responsible before God for your acts, but you are responsible only to me." It is a pity that this interesting ceremony is never reproduced at Washington. Such a speech would well befit the President, and it would do much toward enlightening the public as to the true military spirit. Shakespeare understood it, for he tells us that "if a king bid a man be a villain, he's bound by the indenture of his oath to be one." (Pericles, Prince of Tyre. Act I, Scene 3), and in recognizing the principle we are simply following the best traditions of our race. Absolute obedience to orders involves, of course, the abdication of conscience and reason, but what are such trifles in exchange for the consciousness of genuine military manliness? The motto, "My Country, right or wrong," is the proper one for the man who does not think but obeys orders.

The outward expression of the military man in brass bands and brass buttons grows inevitably out of the conception at which we have been taking partial glimpses. A livery becomes the obedient; the proud display of all sorts of finery is not out of place in the man who is sensitive as to his dignity and given to boast of his achievements over the feeble, while a general reversion to the primitive taste for head-feathers and gold-lace is to be expected when a man's trade is the legitimate offspring of the tomahawk, assegai and tom-tom. As I close my eyes and muse upon the new manliness it takes shape in my mind in the guise of that human turkey-cock, the drum-major, magnificent with padded chest and towering hat and plumes, whirling his glittering baton in an inextricable maze of bass-drums and puffing cheeks, while the humble civilian world bows prostrate before him.

## THE KATIPUNAN SOCIETY

STRANGE as it may seem the strongest force in the Philippines in behalf of liberty and independence rests in a secret society called Katipunan.

Born in the East, its founders and members of a mixed race, of which China contributed a considerable part, it is not strange that its methods resemble those of the Boxers or those of the Hatchet Men, whose ways sometimes disturb the Chinese quarters of American cities.

The avowed purpose of Katipunan is to establish a communistic republic in which the intelligent shall rule, thus hinting at its Chinese origin. On the other hand obedience is its first law. Death must follow any revelation of its secrets. Refusal to execute a Katipunan decree, the levying of illegal tribute, misappropriation of funds and other breaches of its code meet with the same punishment.

Sudden and violent deaths among its members testify that this statute is not inoperative. Each member obligates himself to obtain two novitiates, thus forming a triangle, the unit of the organization.

The American Secret Service, according to the New York World, has been spending a great deal of effort to ferret out the full details of this secret society. Among other things it learned that Aguinaldo is the author of the present constitution.

# A REFORMER WORTH STUDYING

## AN IMPRESSION OF JACOB A. RIIS AND HIS INTERESTING WORK FOR HUMANITY

WRITTEN ESPECIALLY FOR OUR DAY BY VINCENT VAN MARTER BEEDE

IT will be generally conceded that a man who for twenty years has been a reporter of crime for "The Sun," with headquarters near the once infamous, but now park-blest Mulberry Bend, should know a great deal concerning "how the other half" in New York, "lives." What Jacob A. Riis says he knows first hand; and, moreover, he has done more practical reforming than any one with whom you and I are likely to become acquainted. Mr. Riis as a reformer is worthy of study. He is as tactful as he is fearless; as Christianly optimistic as he is aware of the misery lying about him. In countless journeys among reeking tenements he has always carried with him something better than a note-book and a sense of humor—a tender heart. When a tender heart is joined to a resourceful mind and a quick hand, something is done worth the telling. He has been largely instrumental in tearing down rookeries, laying out parks and putting up school buildings. It was not long ago that Mr. Riis talked to us in Cambridge about Tony, the typical New York street boy, and his relatives.

"Five years ago," said Mr. Riis, "50,000 children were out of school in New York. The machinery of the truant system creaked. O what a lovely system that was. Truant officers hounded boys for whom there was no room in the schools, and sent the youngsters—where? To jail! It was the School Committee that ought to have gone to the Reformatory. Then, too, I object to policemen getting too closely on the trail of Tony. Policemen make of Tony an anarchist. When Tony got into the Reformatory, how was he treated? The less said, the better. I asked a superintendent of thirty-four years' experience: 'How do you classify your boys?' 'Well,' he answered, 'I classify those under four feet seven inches and those over four feet seven inches.' Corruption? Nonsense! What is the matter with us half the time is rank stupidity, 'with incidental corruption' as Mr. Cleveland would have put it. We talk glibly of men being 'created equal,' and of the public school being the cornerstone of American liberties. That corner-stone almost crumbled away in New York. Our common sense, plus brains and conscience, came late. Our schools were stuffing machines and the stuffing was bad, very bad. They turned out wretched little mannikins instead of healthy boys filled for life's work.

"When my good friend Roosevelt—one of the best men living—was president of the Police Board, we needed two thousand new policemen. They had to pass civil service examination. One of the questions was: 'Name five of the original thirteen states'; and three of them in one batch answered 'England, Ireland, Wales, Belfast and Cork'! They hailed from over yonder by descent, yes! but they had gone to school here, or they would not have been in the competition. 'Who is in charge of the city when the Mayor is away?' ran another query. It was really an unfair question. I hardly know myself and it makes little difference. Tammany is in charge all the time. One of them wrote: 'The Fire Department.' I wish it was, and that they would have the hose in the city hall awhile.

"Nineteen girls out of a class in cookery hadn't heard of Napoleon. One of them remembered about him after awhile. She believed that he had two wives. You should have seen Mr. Roosevelt's face when he read the policemen's papers, that Abraham Lincoln was president of the Southern confederacy, was murdered by Jefferson Davis, or 'Ballington Booth.'

JACOB A. RIIS

"Is civic virtue to come out of this kind of schooling? Well, sixty new school buildings, a thousand children in each, have been going up of late. The fetich of the three R's is being smashed.

"There is a stronger factor than schooling that goes to make the boy in his play. Froebel said that play is the normal occupation of childhood through which he first perceives moral relations. When will this nation understand that the kindergarten and athletics are a solution of the question of Tony's troubles? Every boy is a steam engine with the steam always up. Play is his safety valve. Don't sit on the safety valve. The policeman does in the street, when ball playing is not allowed, the landlord watches his windows in the yard; everywhere the sign, 'keep off the grass.' The boys explode. His gang 'lays for' a policeman. People reading of the occurrence in next morning's paper, cry: 'Horrible! What a hardened young criminal!' Until two years ago, my friend, there was no spot in New York that the boy could call his own. On 711 acres of the East Side 324,000 people were crowded out of sight of anything green. In a space equal to the area of Central Park there were no grassy backyards. Children's playgrounds were bounded by the gutters. 'Keep Off the Grass!' yelled sanctimonious signs in the parks. Grass is sacred; boys aren't. It is a crime for a city to grow up and fence in children. A boy must have a chance to kick a ball across a lot. He cannot be a whole man unless he has been a whole boy.

"Respect for law is another proof of character. To many in the slum Sunday saloon backdoor is as The Excise law is a joke. The well patronized as the every-day front door. There is spice in law-breaking, you know. Again, liquor must not be sold to minors: but I have seen a child of six spelling out the prohibition sign placed over a bar as his primer lesson. Saloons are forbidden within two hundred feet of a school or church. Tony in Mulberry Lane could count seventeen within the forbidden distance of his school. In the Lexow days they were taught to measure the distance with string. The Jews on the east side use a lot of poultry in their holiday seasons. For sanitary reasons they were forbidden to kill the fowls at home. But live fowls were sold in the markets and they bought them. On Friday a squad of policemen were stationed here to follow the purchasers home and ascertain what was done with the fowls!

"I am reminded of the tale of the stork in the cornfield at home in Denmark. The stork was eating up the corn and a man with a gun was sent to the field to shoot the bird. But he had big feet and the wise men of the village reasoned that he would tread down more grain than the stork, so they put the shepherd on a door, which four men carried into the field, so that he might shoot without doing any damage. So the stork was slain and the grain saved.

"The strongest factor in any boy's development is, or ought to be, respect for his father. I must confess that very often I feel inexpressibly mean when my own boys—fine little fellows they are—make a hero of me. Every father is his boy's hero in the growing age, except Tony's. He is a foreigner. He is slow. He is 'Dutch'—that sums it all up, and he loses his grip on the boy. These were

the last props. Take a look at Tony in the reformatory. Here are statistics derived from twelve thousand cases of bad boys, so-called. Of that number, 42 per cent. appear to be entirely devoid of moral sense; 35 per cent. show a trace of it; three-quarters have good mental capacity; 50 per cent. come from bad homes; all but one in a hundred have been in bad company; the faults of that one are perhaps due to heredity. The kind of heredity that crops out in certain boys needs to be attended to by a physician. Our business is to attend to Tony's environment, for the sake of the future, as well as the present generation. That is our practical heredity. The doctrine of pessimism in regard to the case of Tony I reckon with liver complaint. Heredity as a cause of sin is of immense value to a man who does not want to work. He 'can't help it!' The Lord will provide. Stuff and nonsense!

"I haven't said much about Tony's sisters. Girls are good, anyway. It is astonishing how many sweet, virtuous girls come out of tenement houses. The girl who marries Tony often reforms him. But I must stop to tell of Fighting Mary. She was meant to be a general. Single-handed she conquered a whole gang of boys. At a charity dinner she slipped her piece of mince pie into her pocket with the gruff explanation: 'For mother,' and discovered in doing it her tender spot. The cooking school does wonders. A factory boy marries a factory girl. After the honeymoon the poor fellow wants something to eat. Any man's stomach, if not properly fed, craves a stimulant, and he drops into the saloon where free lunch is served with drinks. Ought the devil to have a monopoly of all the good lunches? A cooking school beats all the temperance sermons or saloon-smashing hatchets that were ever preached or swung.

"The Fresh Air Fund, too, goes to the heart of things. Sunday School talk alone 'does not go.' Tony doesn't understand it. Put him among the fields and forests, and when he gets back from them tell him stories from the Good Book. There are no cows on Mulberry street, you know. When Tony sees them chewing the cud in the pastures he inquiries: 'Do you have to buy gum for all of them cows to chew?' Squash fields blossom, and Tony thinking they blossom only for him, carries off the flowers and destroys the squash. All very funy; but our ignorance in dealing with Tony is not amusing. It has been criminal all these years. Think of a child crying out at the first sight of the country! 'How blue the sky is! And how much there is of it!'

"The boys' club heads off the reformatory. The 'gang' is a boys' club run wild. The successful boys' club is the result of sane methods, and sometimes a gentle little woman with a sweet voice will be the centre of a motionless, open-mouthed circle of toughs whom three trustees and two policemen had given up as incapable of being controlled.

"Tony's millenium is about to dawn, in spite of Tammany schools and Tammany politics. We are going to turn the great waste of school rooms at night into club rooms, and school roofs into playgrounds. We must identify the boy's play with his school. Play and education must go hand in hand. Then there will be no truancy. We must strive for the enthronement of the three H's—the head, heart and hand. Miracles are wrought by such simple means, the same old forces that moved mountains of old: faith, hope and love. Through the kindergarten and the cooking school lies the path of advancement for Tony and his sister.

"Tony wants the playground most of all. It took ten years to turn Mulberry Bend into a park. Before the park was opened I myself had gathered the facts of seventeen murders committed in that vicinity. Since the opening of the park not a murder has come to my notice in that neighborhood. Decency came with the sunlight. The Park cost half a million. It was cheap. Where there was a bad citizen, there is now a good one. A Boys' Club is more effective than a policeman's club. The right to play baseball is as necessary to the well-being of the Commonwealth as is the Habeas Corpus act—these are the municipal A-B-C.

"That the social settlement is a tremendous instrument of reform for Tony, everybody knows. It gives the human touch. Cold heart was at the bottom of our old failure. Loving sympathy is the cure. 'My children, love one another.' That is the gospel that redeems the slum. Along that line everything counts. Following that we may leave the rest with God who sees it all and where it tells. If one short human sight prevents us, don't despair. It does tell, be sure of it."

## THE ART OF MAKING SHOES FOR PECULIAR FEET

SOME interesting information was brought out in a suit for $310 for a pair of shoes for a cripple made by a New York shoemaker. In this case the cripple himself would have gladly paid the bill, but, being left to his brother, who had never suffered from anything more than a bunion, he objected. The judge ordered the bill paid. The New York Sun was accorded an interview with the shoemaker, and its representative was taken into a large room whose walls were hung with dozens of leg braces, shoes with soles and heels from 2 to 6 inches in thickness and others in great clumsy shapes obviously intended for club feet. There were crutches, too, and iron supports. Around the upper part of the wall were wax models of inconceivably deformed feet. The shoemaker has 2,000 plaster casts of such feet which he has fitted. From a sort of chandelier in the centre hung little wax models made from casts of babies' feet. It was sickening, but the professor gazed about him with open pride.

"Perfectly formed people do not dream," he said "of the suffering of mind and body which the unhappy owners of these feet have gone through. I once lived for two years and a half with a young man who was crippled by hip disease. I had always been a shoemaker, but according to the old methods. I saw for the first time how little those methods did for the cripple, and I began experimenting on my friend to find some way of relief.

"I must have put him through a great deal of torture in the course of the experimenting, but we won out in the end, and from that day to this it has been my mania, really that, to make shoes for cripples.

"Not a great while ago a millionaire with club-feet came to me. He was 41 years old and had suffered enough to have been 4,100 years at it. When he came to me he asked me what I would charge to make a pair of shoes for him. I wouldn't say. He insisted.

" 'Now, see here,' I said, 'I will make some shoes for you and you can try them thoroughly. If you don't like them you need not pay one cent for them or for the time and study I put into the case. That is a fair proposition, isn't it?'

"He agreed that it was, and I went to work. First, of course, I made plaster casts of both feet. Then I study over these for days. This is the hardest part of the undertaking—the part that demands all the knowledge I have gained by years of patient study and experiment. I have had thousands of deformed feet to fit, but I have never had two exactly alike. Every case must be worked out by itself.

"When I have decided on the bases I must have in use in the foot I set to work to devise a shoe which will bring the weight upon those bases. I make a dummy shoe and then I have the patient come here and try walking in it. I watch him, and add thickness here, and take it away there until he says, 'Ah! that's right!'

"Well, in this case I finally got the shoes made, and my patient seemed satisfied with them. Again he wanted to know how much they were.

" 'Wait!' I said. 'These shoes are still my property. You wear them two weeks and then you come back to me.'

"In two weeks he came back saying that the shoes were all right, and that he wanted to keep them.

'Not so fast,' I said. 'Wear them five days and bring them back.'

When he came for them the next time I told him that the shoes were as nearly perfect as I could make them, and again he asked for the bill.

"I told him to go home and write me a check for what he considered was fair. If I was satisfied I would keep the check and he could keep the shoes. If not, we would trade back again. He could keep the check and I would keep the shoes and we would part friends. Well, he went away and several days passed before I received the check. I don't know how many he had written out before that one, but the one he sent was for $5,000.

"Oh, it's a wonderful study," exclaimed the shoemaker and his eyes glistened. I look at a deformed foot or a crippled leg as if it were a problem for me to work out. When I've done it I have a glow of pride and triumph that is worth more than money to me. If I could live on that I'd work for nothing."

# THE DISCOVERY OF OIL AT BEAUMONT

## EPISODES IN THE OPENING UP OF GREAT NATURAL WEALTH IN THE LONE STAR STATE

THE excitement which ensues on the discovery of natural wealth of unusual extent is comparable only to the excitement seen on Boards of Trade, where fortunes are made and lost in an hour. The excitement over the discovery of oil at Beaumont, Texas, has rivalled that of finding gold at Cripple Creek. In a few weeks time it has transformed a quiet little country village into a seething mass of business men, each struggling for a foothold, while the country round about is filled with prospectors and such oil gushers as few have ever seen before. Up to the time when the first gusher was opened, this section of Texas was chiefly remarkable for its rice fields and forests. It was here that rice culture was fast becoming a most profitable industry, but now both lumbering and the rice fields are forgotten.

The demand for office room in Beaumont has been so great that values have jumped up from hundreds to thousands in the time limit of a day. Jack Lack, a tailor occupying a little store next to the postoffice, consented to move only when greenbacks to the amount of $5,700 were placed in his hand. Further down the street, Schwartz's piano concern occupied a very desirable place, and the new bank, to get the building, had to pay Schwartz $3,700 in cash and 100 cents on the dollar for his stock of pianos. The bank then sold the stock out at 70 cents on the dollar. Frame booths, dignified by the name of oil offices, now cover every available space on sidewalk, porch, along the railroad track and in the backyards within a radius of several blocks of the Oil Exchange, and the ringing of hammers and the singing of saws comes through the dust-laden atmosphere day and night. The Beaumont postoffice has been swamped for weeks, and, notwithstanding the five extra employes recently secured, letters and newspapers are accumulating faster than they can be distributed, and, as a result, there are now no less than half a dozen large dry goods boxes filled with letters standing in corners awaiting attention. These letters are all what is known as "general delivery" and bear no other address than the name and town. Nearly 20,000 letters from all parts of the United States reach Beaumont addressed care general delivery every day. The Beaumont postoffice force includes nine men all told, including carriers, distributors, assorters, stamp men and postmaster. To alphabetically arrange 20,000 letters a day would require the services of nearly this number of men, but only two or three are really available for this work.

The founding of an oil company is a very profitable business if sagaciously managed, with a proper regard for self on the part of the organizers. Two or three, or six, or a dozen men get together and make up a jack pot with $500 or $1,000 or $10,000 or whatever it may be, they purchase land in the oil fields or near as they can get to it. Then they organize a company of say $150,000 capital. They keep for themselves, say, $100,000 of this stock in payment of the land they have put in and other costs of organization, and the rest of the stock is put on the market. If $50,000 be realized from the sale of the stock at par, this amount is applied to expense of boring for oil, advertising, clerical help, etc. This is about the plan, but no one but the man who has organized a company knows how much of the stock is appropriated by the promoters to their own reward. An oil man told me it was frequently nearer 90 per cent. than otherwise. This is the weak point of these companies and one which the scalpel of the public does not reach, that purchasers of stock are not advised of what proportion of the capital stock is held by the promoters for their own account. A heavy capitalization on a small realty holding with a small proportion of the stock put upon the market for the public, means heavy and almost certain rewards for the promoters and a corresponding diminution of prospects for the share-purchaser.

The situation at Beaumont is undoubtedly complicated by the discovery of natural gas in what promises to be quantities heretofore unheard of. Modern piping possibilities permit of the delivery of gas with commercial practicability as great as 200 miles. To do this may necessitate the establishment of relay pumps, but the probability seems to be that the gas from the well would be sufficient for through delivery. Of course the natural gas will give out eventually, but the same mains may be used for the purpose of piping gas manufactured at the oil fields. This would have the effect of rendering the territory within a radius of 300 miles of the gas and oil fields particularly valuable to manufacturers and would naturally result in an extraordinary enhancement of property values within all of the fortunate area.

It is not to be understood that gas will in anywise be a competitor of oil, for while natural gas is of utility as fuel in respect to domestic institutions, it is not considered practicable under boilers. But the economic question of illuminants would always make a section reachable by natural gas superior for manufacturing purposes to one not enjoying that advantage, for the reason that it would cut down the cost of living and generally have a tendency to increase population.

In West Viriginia and Pennsylvania natural gas is being piped 100 miles and upward and a pipe line 300 miles in length is now under construction into the city of Baltimore, or at all events the plans for its completion have been perfected. It is calculated that the average cost of piping with pipes of adequate size through a country such as this would not fall far short of $6,000 per mile.

Even with the imperfect development of the Beaumont oil fields at this writing, it is abundantly evident that the field eclipses and transcends any that has ever been discovered in the history of the world. A single gusher of the Beaumont field will produce more oil in twenty-four hours than all of the California oil wells combined, and with only the wells thus far opened up operating, the Beaumont oil field can produce within a year one-half the total amount of oil derived within the same period from all the American oil wells combined.

## MR. CARNEGIE'S HIGHLAND CASTLE

FEW castles in Great Britain or Europe are more familiar to the American reader than Skibo Castle in the Scottish Highlands. Skibo is in Sutherland, one of the two northernmost counties, and is far removed from modern highways. Dornoch is five miles away, and the nearest station is seven miles distant, so the residents at Skibo castle and Clashmore village, which is on Mr. Carnegie's estate, have to be endowed with self-reliance.

When Mr. Carnegie began to spend a portion of each year at Skibo the accommodations were not abreast with even the modest modern requirements. He therefore enlarged and improved the structure at a cost of $200,000. The internal furnishings are not yet all complete, but Mr. Carnegie and family have taken up residence in a wing of the castle which has been got ready for occupation. One of the features of the new building is the hall, of noble dimensions, with marble columns, stained-glass windows, and elaborately paneled ceiling. The staircase is of the purest white Sicilian marble. Oak is the wood mainly used in the large public room, and the corridors are of oak and walnut, with parquetry floor. The drawing room and boudoirs are decorated in fibrous plaster. The library at Skibo is a fine apartment, 38 feet 4 inches by 22 feet 4 inches, and fitted up in the most approved way. The tower has a flat roof, so that on a calm clear day a magnificent Highland scenescape is before the eyes. Dornoch Firth, the Kyle of Sutherland, and the glens and ranges of hills to the west are particularly fine.

That very important apartment in a northern castle, the gunroom, is situated on the ground floor, and measures 25 feet 6 inches by 21 feet, giving plenty of accommodation for the multifarious equipment necessary in the shooting season. A separate doorway leads to the outside and is for the gillies and gamekeepers. In wet weather—and when it is wet it is a downpour in the Highlands—a recreation room is waiting the visitor; it is 63 feet long by 18 feet broad, and has the customary gymnastic appliances.

In architecture Skibo is of the Scottish baronial style, and has the corbeled and gabled roofs, square turrets with embrasures, and crow-stepped gables which are associated with the sixteenth century. Behind the parapets there is a communication way all round the house. To facilitate the work at the castle, barracks had to be erected for the men employed, and a temporary bridge 120 feet long was thrown over a ravine, while the majority of the servants are meantime housed in a temporary building erected close to the castle. Stone will

not be a heavy item, as the whole stone used was quarried not three miles distant on Mr. Carnegie's land. Later swimming baths are to be erected on the seashore—the North sea, which is bracingly salt off this northern coast—and here, too, Mr. Carnegie has planned for a new electric power station to be constructed.

## MOVING DAY WITH DR. PEARSONS

DR. D. K. PEARSONS, the man who has given millions to struggling colleges, had moving day come to his Chicago office a few weeks ago, the first moving day in thirty years, and it set him to thinking. Part of his thoughts he uttered into the ear of a friend who fortunately wrote them out in the doctor's familiar style of conversation.

"Here's a bundle of sermons that beat any pulpit orations I ever heard," said the old philanthropist, gazing sadly at a huge pile of deeds, receipts, check books, timber land charts and lumber scale volumes. "There's death and success and misery and failure and all sorts of things written all over 'em. See here," and he took up a heap of papers. "Wilson, Noble, Richardson, Blake, Edwards—all dead and gone, every one of 'em. There's hardly a man among the dozens and dozens whose signatures are here that hasn't been turning into dust for years. And here I am as young as ever.

"Most of 'em died poor, too. Some worse than that; not enough left for the funeral. And every one came here to Illinois when the cherries were ripe and the apples dropping from the trees. God flung a garden of wealth before 'em, and they couldn't even keep what they garnered. It's most always the way. Those that pluck the first fruits drop them more often than not into other folks' laps."

"Talking about the cherries being ripe when all these poor dead fellows came West," continued Dr. Pearsons, "why don't more of our young men today realize that there is still a wonderful harvest waiting? Where do I mean? Why out in Oklahoma, in Montana, in Colorada, of course. If I was fifty years younger I'd be off between sunset and daybreak, and along about 1950 you'd see me giving away money for the poor girls and boys just the same as I'm doing now. The chance is there: the future is there. That's part of the sermon these old papers preach to me.

"Among the dead men whose work lies there in front of you," he went on, "were hundreds who bought my lands for me, interested themselves in my welfare and helped me to wealth and fortune. When I give away my money I feel that a good part of it is their money too, and maybe that they know and are glad about what I am doing. I made every man who ever worked for me feel a personal interest in my affairs. That is why I make my college gifts like I do. Nothing outright. Oh dear no. For every penny I give somebody else must give something too. What's the result?

"I'll tell you. Every soul that subscribes, even if it's only $5, to the endowment fund of a college begins to get it into his head that the place in part belongs to him. He talks about the college among his friends; reads about it and dreams about it. You see we get their money and their interest at the same time. And when you do that you are doing good business. That's another thing these old papers teach me. Deeds are curious things to find sermons in, ain't they, my boy?" he said with a chuckle. "But as for that I found a good sermon once in a can of condensed milk. It's a wise thing to look for 'em at all times, and it's good business to find 'em."

## ECONOMICS OF THE BOER WAR

THE public men of Great Britain are waking up to the financial loss incurred by that country in following the will-o'-the-wisp in South Africa. The recent financial budget and the sale of £60,000,000 of government bonds is leading to a careful study of the situation and possible returns after the war is closed. Sir Robert Giffen, attempting to sustain the position of the government in the Economic Journal, takes a more optimistic view than some of the leaders but even his figures are not encouraging.

The total cost of the war, he thinks, cannot exceed £100,000,000, which is "not more than one-sixteenth part of one year's aggregate income of the community." The net loss to the country now estimates at the rate of £30,000,000 per annum. How much longer it may run on at that rate is a matter of conjecture.

The next question considered is how much of the cost of the war can be extracted by the conquerors from the conquered. Sir Robert considers this mainly a question of the productiveness of the gold mines. They had yielded as much as £20,000,000 in a single year, of which one-half might be considered profit, and on this profit a tax of one-fourth might be fairly laid, i. e., a tax of £2,500,000. As much more might be expected from other sources of income. But it will cost as much as £5,000,000 per year for armed occupation and police of the countries. Any balance to pay interest on a war indemnity must come from increased production of the gold mines. Very likely there will be an increase, but not at once. If there should be no increase, no indemnity can be paid. "Then," says Sir Robert, "we must make the best of a very bad bargain." The amount of the war indemnity in Sir Robert's opinion, cannot exceed £50,000,000, and the amount of annual interest to support it would be £2,000,000 per annum. If this should be realized, and if the war should not be protracted beyond present expectations, the direct loss in money to Great Britain would be £50,000,000.

The cost of the military establishment was £20,000,000 per annum before the war. Sir Robert thinks that it must be raised to £40,000,000 or £50,000,000. It is necessary, he says, to have 100,000 men in readiness to move at a moment's notice, with 100,000 more to follow immediately, and more behind to be mobilized with some little delay.

When this foreign policy was assailed in the House of Commons Mr. Balfour's only reply was that England had the responsibility of a great empire beyond the seas to look after and defend, and that she must have the men and the tools to do the work, whatever the cost. And yet there must be something "rotten in Denmark" when a great nation must pour out $500,000,000 in treasure, and thousands of precious lives in order that the foreign owners of gold mines in the Transvaal can vote after a residence of five years instead of seven years.

## THE DIRECT PRIMARY IN MINNESOTA

A NOTABLE victory for the direct primary system has just been gained in Minnesota. The Outlook calling attention to it says that two years ago the legislature of that state passed a bill permitting the county of Hennepin, which comprises little more than the city of Minneapolis, to use a system of direct primary voting for the nomination of all candidates for offices voted for within the county. The success of the trial of this plan was phenomenal, surpassing the expectations of the advocates of the reform. When it was seen that a larger percentage of the voters participated in the primaries in Hennepin County than was usually counted at the polls, a demand at once went up from the rest of the state for an extension of the law. This demand was most insistent in St. Paul and Duluth, the two remaining large cities of the state, but the legislators from the country districts soon became aware that their constituents also were anxious to be relieved from the control of the boss and slate-maker by securing for themselves the benefits of the Hennepin primary law.

The law covers nominations for Congressional, legislative, county, and city offices, and district judge-ships; it does not apply to state offices nor to local offices of villages and towns. The exception of state offices was conceded as a compromise to carry the measure through in the House. In towns and villages where all the voters know each other, the evils of machine nominations have not had a chance to develop. The main provisions of the new law are summarized as follows:

Any person who wishes to become a candidate for the nomination to any office may do so by filing an affidavit with the county auditor and paying a fee of ten dollars, or, if the office is to be voted for in more than one county, by filing his affidavit with the Secretary of State and paying a fee of twenty dollars. No person defeated at the primary election can go on the official ballot at the final election. The primary election will be held on the seventh Tuesday before election, which is also to be the first day of registration, and any person entitled to register may vote. Australian ballots are to be provided for each party participating in the election, and each voter must declare his party affiliation before receiving a ballot. If challenged, the voter must make affidavit relative to his party preferences.

This most important reform has been brought about, not by strenuous agitation, but rather by the logic of events and by the powerful influence of a highly successful experiment which refuted every objection that could be urged against it.

# THE LARGEST BRIDGE IN THE WORLD

## DESCRIPTION OF PLANS FOR THE NEW STRUCTURE TO BE BUILT ACROSS EAST RIVER

BY LEWIS NIXON, PRESIDENT OF THE NEW EAST RIVER BRIDGE COMMISSION

UNLESS in the immediate future some of the magicians of science spring a surprise upon the world, the New East River Bridge, thrown from Manhattan to Brooklyn, will be the first great record-breaker of the twentieth century. It will, when finished, mark the climax of achievement in bridge building. In many respects it will be one of the most remarkable structures of its kind in the world. As a suspension bridge it will stand unrivaled, and as an engineering feat only one bridge can approach it, its near neighbor, the Brooklyn Bridge. Indeed, the latter is the only suspension bridge in the world to be compared with it, and to give some idea of the magnitude and ambition of the new bridge some comparative figures between it and the old will form the best illustration.

The greatest contrast between the two lies in their relative strength. Roughly, the New East River Bridge will be four times as strong as the Brooklyn Bridge; each of its four cables will be about twice as stout as those which support the span of the older structure, and in other respects its superiority in strength will be maintained.

Each of the four cables will consist of 37 strands, and each strand will have 282 single wires, a total of 10,434 wires in each cable. The normal pull on each cable will be about 5,000 tons, and as each will be capable of supporting 200,000 pounds to the square inch, and will have 222 square inches, net, the engineers calculate that the suspension power of the bridge will be four times greater than the maximum demand upon it.

The width of the new structure will be 118 feet, as compared with the 85 feet of the Brooklyn Bridge, and the character and amount of its traffic accommodation will be proportionately greater. It will have six railroad tracks, two carriage ways, each twenty-two feet wide, two footwalks, and as concessions to the growing tastes of the public, two bicycle paths.

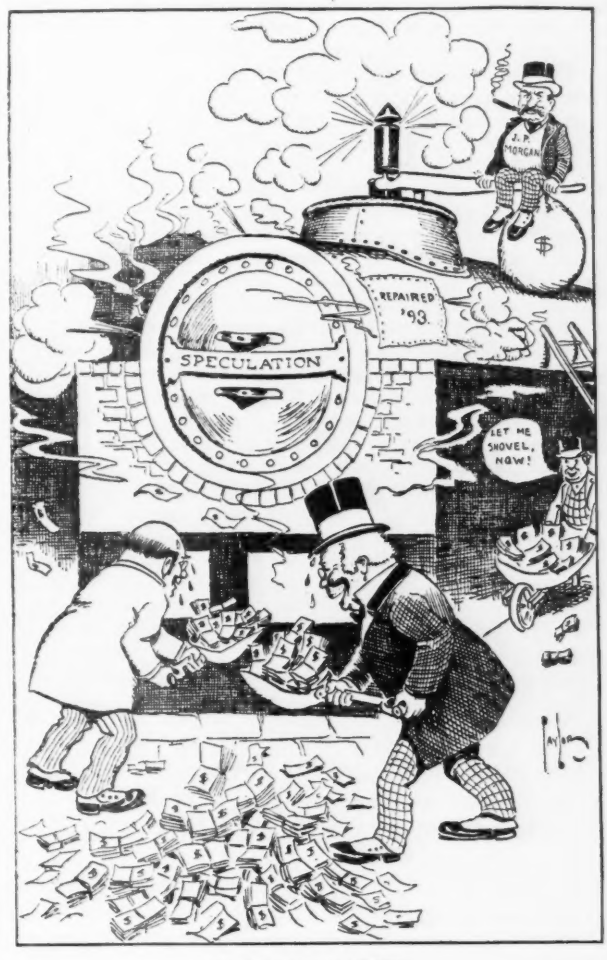
In actual channel span, the two bridges will not present a great difference, merely a matter of four and a half feet, but in the total length of the span the new bridge will claim the record by 1,200 feet. The Brooklyn Bridge has a channel span of 1595½ feet and a total length of 6,000 feet. The figures of the new bridge are respectively 1,600 feet and 7,200 feet.

The steel towers of the new bridge are about 59 feet taller than the masonry spires of Brooklyn Bridge. The cap of the steel work from high water is 335 feet; similar measurements on the Brooklyn Bridge give a height of 276 feet. The minimum height of the bridge for 200 feet on either side of the center above mean high-water of spring tides is 135 feet; the Brooklyn Bridge has the same height, but only at the central point.

The work of building this bridge is a work of daring and enterprise, complicated and full of the most delicate detail. It has brought forth the display of the greatest skill in engineering and the perfection of mechanical appliances. From the sinking of the stone piers to their bed of rock, 115 feet below the water level, to the spinning in mid-air of the mighty cables, the work has been performed with unerring precision and fidelity. The sinking of these piers was done in a depth of sixty feet of water and presented a difficulty real and hazardous.

The stretching of the cables from tower to tower will be an affair of the greatest labor and niceness. It would be hard to present the delicacy of this operation to the lay mind, but a conception of it may be given when it is said that these enormous cables will have to be twisted, two tiny wires at a time, high in mid-air. The preparations for spinning those cables are now under way; the four solid steel saddles, each weighing thirty-five tons, over which the cables will pass, are in place at the top of the towers, and all is being made ready to sling the first wire. But before that can be done, a sort of minor bridge—but one, which, by the way, will cost $200,000—will have to be erected, and from this the work of constructing the cables will go on.

This foot bridge will consist of a suspended structure of three spans, one of 1,000 feet between the two towers, and two of nearly 600 feet each between the towers and granite anchorage. The middle span will virtually consist of two narrow parallel double-deck bridges, 67 feet apart on centers, and connected by cross bridges 160 feet apart. Making the connection between the towers for this foot bridge is an interesting operation in itself. Contrary to precedent in such cases, the first bond of union is a heavy cable, weighing over twelve tons, and not a thread or light line as was used in the Brooklyn and other suspension bridges. Here is how the connection was made. The end of the wire rope, two and a quarter inches in diameter, and 3,000 feet in length, was attached firmly to the anchorage on the Manhattan side. The other end was then passed over the tower on the Manhattan side and down to a flatboat at the edge of the water. On this flatboat the free end of the cable was fixed, and a tugboat started slowly on the trip across the river, the cable being carefully reeled off, so as to sink toward the bottom of the stream, between the flatboat and the side of the river on which it was attached, that it might not impede navigation during the time that the cable was being pulled across the stream. When the cable had been stretched across the river the unattached end was passed up




A BOILER IN DANGER

—*The Chicago Tribune*

over the Brooklyn tower, and the line hauled from the bed of the river and drawn taut till the loose end reached the anchorage on the Brooklyn side.

With the completion of the temporary bridge will begin the stretching of the cable proper. The necessary wire for the main cables is now in the course of manufacture at Trenton, N. J., and will be three-sixteenths of an inch in diameter, and, as I have already said, will be capable of sustaining a strain of 200,000 pounds to the square inch. Each wire will be made 4,000 feet in length, and will be shipped to the bridge site on drums. In each cable there will be 10,000 wires laid straight and parallel to each other, which will be first grouped into strands of 36 to each cable. Each strand will contain 280 wires, and will be temporarily wrapped. When the 37 strands for

each cable are made, then the temporary wrapping is removed and the 10,000 wires are grouped together in a cylindrical cable. Each cable will be held in form by heavy clamps of steel weighing about 400 pounds each. These bands will be placed 20 feet apart and will secure the suspenders to the cables. These suspenders are to consist of 4 strands of 1¾-inch twisted steel wire rope, and to each of these suspenders the end of the floor beams will be attached. The floor beams and the entire structure will be thus suspended from the cables proper by the suspenders. When completed, the cables will be sheeted with a casing of sheet steel about 1-16 of an inch in thickness, overlapping, in order to shed the water.

The operation of cable making will consist of an endless rope, moved in both directions by a steam engine placed in the construction plane of each cable. This rope passing around sheaves at the anchorage will carry a bight of the cable wire across the river. The loops at both ends will be received on shoes, which will rest on legs several feet from the anchor pins. This arrangement will cause the strand, during construction, to hang from twelve to sixteen feet above its final position, and afford an opportunity to adjust each wire separately to exact parallelism with a standard wire. As the end of one coil is reached, it will be spliced to the end of another coil, and the wire made continuous throughout the strand. The wires in each strand will be lashed together in an approximately cylindrical shape, lowered several feet, and united to form the cable, which will be built in a vertical plane and afterward moved transversely, to give it the required cradling. As explained during the process of cable making in previous suspension bridges, including the Brooklyn Bridge, the strand wires have all been pulled across from one side of the river, and the cable making has been performed by a limited number of men in traveling cars, suspended alongside of the cables. This, however, has been vastly improved upon in the case of the new bridge, where the wires will be pulled across from both sides of the river.

It has been so arranged that two strands of each cable or eight strands in all, can be simultaneously made, and a practically unlimited number of men can work on them simultaneously by means of the foot bridges, which form the working platform under each cable for its full length. For this operation four sets of machinery will be required, and these will so expedite the work on the four cables that they will be built more rapidly than ever before thought practicable.

The weather will play an important part in the making of these cables. In calm weather the work can be carried on without interruption, but it will almost entirely cease during high winds. The cables at each anchorage will be attached to the forty steel eye bars, fourteen feet long, which are built in solid masonry. These will be walled in with granite blocks of the same size as those used in building the anchorage, after the cables have been attached.

This new bridge will, indeed, be in every way a remarkable structure, and a striking monument to American engineering genius. There is no space here to speak of its commercial value as an investment by the city of New York, but it will be worth many times the $18,000,000 to be spent upon it.

## THE COURTSHIP OF BIRDS

IF we would study the weak side of bird character, perhaps we could find no better time for our purpose than the period of courtship. I do not mean to say that all the traits exhibited by birds at this period are weak, for many of them are wonderfully strong and beautiful. It is at this time that birds show the greatest love for their mates—a love which is in many cases manifested by the outpouring of the sweetest music or by the lavishing of the tenderest caresses. But it is at this time, also, that the spirit of rivalry is the strongest, and the mates, especially, of many species become intolerant of all others of their sex. Many exhibit selfishness, anger, jealousy and hatred, and some will even fight their rivals to death.

Certain birds, when the period of courtship comes round, repair to particular trysting places and announce their presence there by well-known calls or signals.

The ruffled grouse, as every one knows, seeks an old log or other convenient perch, and drums with his wings, a hint to any lady grouse within hearing that "Barkis is willin'."

The woodpeckers, too, drum upon resonant tree-trunks and branches with their bills to let their sweethearts know they are waiting; the bittern "booms" in the marshes, and many other birds are known to have calls of various kinds, peculiar to the season of love-making.

## A WATCH AND ITS IDIOSYNCRASIES

AN old jeweler who has handled thousands of watches in his lifetime and has observed a few of their numerous peculiarities was talking one day on this subject. In the course of his conversation he said:

Watches, all joking aside, are really almost human sometimes. They take cold readily. Never lay a watch on a cold marble table or near an open window, all night, after you have worn it next to your warm body all day; it will contract a sort of pneumonia, and ten to one it will stop before long if the practice be continued. The cold contracts the metal pivots, which, small as they are, must not be smaller, and they shrink. Thus the wheels cannot move.

Watches are magnetized, too, by the persons who wear them. I have seen the statement that watches vary in time-keeping with the health of the wearer, and that if changed from one person to another they will also show slight variations. All of that is true. The static electricity of a person may affect a watch. All of us throw this off; some more than others. Dark persons give off more than light ones do, and a dark woman, more than anyone else. Dark women should have rubber cases for their watches, if they wish to have them keep perfect time.

Never lay a watch flat, at night, after it has been worn in a vertical position all day. It throws it off its base, so to speak. If the pivots be worn, the wheels will not run level.

A watch should be fed or oiled every eighteen months, even if running in the best of time. The oil dries in that time, and the wheels are likely to wear one another. Wind your watch in the morning. No, not at bedtime, but when you get up. That gives it the full spring to work on during the day, when the jars and jolts are more numerous. And hold your watch still when you wind it, and wind the key.

## WHAT BECOMES OF THE CORKS

CORK is one of the most indispensable articles; yet, useful as it is and harmless as it appears, it is made a means of danger to health by trade competition. Not that anything noxious occurs in the original growth or preparation for the market of the corkwood, or even in the process of charring the surface and closing the pores by extreme heat, which is said to give the elasticity and flexibility known in the trade as "nerve." When it comes on the market it is without any deleterious qualities. It is after the cork, in its finished state, has served its purpose in the neck of a bottle that it begins its degenerate course.

A cork once drawn, and the bottle and contents disposed of, is thrown away generally as waste, especially in private houses, though in the liquor trade they are often preserved for sale to itinerant dealers, who purchase them for a trifle.

Nothing will really clean them, but they can be whitened or bleached by the action of a powerful acid, and this is what is done. The acids used are chiefly sulphuric and muriatic or hydrochloric. Vitriol is also sometimes employed. The trade is quite a large one, and is said to be very profitable, many having grown rich at it, and carrying on big establishments, with agents at all main points. It is conducted mostly by foreigners.

## A WORLD CONGRESS ON CONSUMPTION

A GREAT congress is to be held in London on July 22 of this year on the subject of tuberculosis, and the discussion of the experiences obtained in various countries for the cure of consumption and the best methods to adopt to bring about its eradication. The congress will last five days, and it will be supported by delegates from all parts of the world, who will advance any information relative to the subject at their command. The King of England, who has always taken a keen interest in the cure of this malady, will open the congress. One of the leading features will be a museum containing a number of pathological and bacteriological instruments, charts and models.

# SOME NEW AND PROMISING INDUSTRIES

## THE OPENING OF DIFFERENT AVENUES FOR THE EMPLOYMENT OF MANY PEOPLE

### A VIOLET FARM in PENNSYLVANIA

TO be a farmer of violets is poetical. Desire Corbin, a native of France, has a violet farm at Overbrook, Pa. Two acres of ground, covered with glass, burst into thick, sweet purple bloom there every day, and every day Desire Corbin and his large family—a tall and beautiful woman with gray hair, four robust and graceful girls in bodices red and white, three strong young men with derby hats a little dented, and a flock of rosy children—go over the two acres and pluck some 50,000 violets. Heaped in baskets, loosely, they bear these to the farmhouse, and throw them, in an indescribable oppulence of color and of perfume, on a long and narrow wooden table. Then they sit them down, some dozen persons, and in an air sweet with the violets' odor, they make the delicate flowers into bouquets, popular in these days of Lent. Working, they converse in French. The walls of their workroom are hung with pictures. Their low and pleasant laughter, their spirited exclamations, are part of a conversation always going on over the soft, sweet purple heaps of violets, a conversation brilliant and wise, a literary and artistic conversation.

Desire Corbin has been growing violets over fifteen years. He sells them in Philadelphia, New York, Boston, and even Chicago, for his violets keep over a week after they have been plucked. They are most of them California and La France violets, but he raises some few of the Marie Louise and the White Tzar sorts. Mr. Corbin puts out some 6,000,000 violets a year. In twenty-eight long, low narrow houses of earth and glass, Desire Corbin's violets grow—houses 120 feet in length, 10 feet in width, six feet in height. In each of these houses 1,200 square feet of space is planted with violets in two long strips, with a narrow path down the middle. Daily this rich soil studs itself with purple violets. One house grows about 5,000 flowers daily. It takes about an hour to pick one house. In all the houses there are stoves, tho' it is rarely necessary to light fires in them. The houses are sheltered from the winds, and the sunlight that they face, entering through glass, keeps them wonderfully warm. At night, after sunset, they do not chill off, because they have walls of thick earth, which, having gotten warm during the day, retain their heat at night as no other kind of walls will do.

Each violet plant, with its leaves and flowers, takes up about six square inches of space. Each plant blooms from October 1 to April 15. Then it begins to spread, to throw out runners, and it is taken up and set in good soil out of doors, while its runners are cut off and new plants made of them. Out of doors, while the plant is flowering, it needs no attention other than a little watering every few days, if the weather be dry, and indoors, during the long bearing season, a watering twice or thrice a week is all the plant requires. The houses are kept at a temperature of about 80 degrees, and the sashes are raised often to give a good ventilation. Violets at the Christmas season sell at wholesale for a cent apiece, and he who buys them from the fashionable florist then thinks nothing of paying five cents apiece for them. A bunch of fifty violets is about 2½ inches in diameter, one of 100, five inches; one of 200, 10 inches, and $2.50, $5, and $10 do not seem exorbitant prices for bunches of such size at Christmas.

Statistics—which no one can controvert, says a writer in the Philadelphia Record—show that 1,000,000,000 violets were grown in 1900 for the market in this country. The crop this year will no doubt be much larger. Besides Desire Corbin's farm, there are about 200 such farms in the United States, the annual crop of each of which foots up 5,000,000 violets.

### GINSENG IN THE UNITED STATES

THAT rare plant, ginseng, for which China pays $2.50 per pound, is being successfully cultivated in Missouri. One farmer has planted an acre. It matures in six years. From the product of that acre he expects to realize the modest sum of $20,000. He will limit the product, so as to keep the price up. Ginseng flourishes in rich limestone soil, shaded from the sun. It requires eighteen months to germinate, and six years for full growth. By the Chinese, ginseng is considered a medical ingredient of wonderful power. A liquor is distilled from it which is supposed to cure all diseases. They have never been able to find the secret of its culture, and have depended upon the wild roots found here and there for their supply.

### TRUCK-GARDENING IN ALASKA

TRUCK-GARDENING in Alaska during the present year will be one of the greatest industries there outside of mining and fishing. During the last three years the Department of Agriculture has had an experimental station near Sitka, and has experimented with grain and all kinds of vegetables. It has been demonstrated that garden truck can be grown much quicker than can be done in the Northwestern states. Prices for vegetables range very high, for the supply is always short of the demand, and will continue to be so for years to come, on account of the attractions of mining and the consequent indifference of the people of the North to other occupations.

### A BONANZA IN BLACK SAND

A PECULIAR industry has been developed at Two Rivers, Mich., by Peter McMillan. The sands along the beach contain a considerable quantity of iron which has been finely ground by the action of the waves and resembles black sand. This when gathered and freed from the white lake sand has found a ready market at match manufactories, where it is used on match boxes. Many tons have already been gathered here, and the trade has proved a bonanza to the owner.

### TEA GROWING IN LOUISIANA

EXPERIMENTS now in progress show that tea can be grown in Louisiana, and the crop is likely to become a standard one in the state if the labor necessary for handling the tea can be obtained. The experiments have been conducted at the Audubon Experiment Station in New Orleans by Prof. W. C. Stubbs.

Dr. Stubbs imported a number of the best varieties of tea plants and now has 150 growing on the farm. He has met with complete success with them and has demonstrated their adaptability to the soil and climate of Louisiana.

"Here in Louisiana we are in a better condition successfully to cultivate tea," he says, "than in South Carolina, where tea culture is a practical and financial success."

The cost of raising the tea plant is infinitesimal. The great expense is in the picking and preparing of the leaves; and this, Dr. Stubbs confesses, is a serious problem.

In South Carolina the work is done by negro labor, but the negroes have to be trained for a long time in order to do the work properly. It is possible that cotton pickers, may, with a little training, be converted into good tea-leaf pickers. At the same time Dr. Stubbs believes that it would be better to have some other kind of labor than the negroes. It is possible that the Chinese or Manila men (Filipinos), so numerous in Louisiana, might serve.

Dr. Stubbs' present estimate is that the tea can be cultivated and fully cured and prepared for market at 27 cents a pound, at which figure it will return a handsome profit at the present price.

### MAKING ARTIFICIAL SILK

THE attempt to manufacture artificial silk—that is, silk produced without the intervention of the silkworm—is still being made in Europe. Consul Malim writes from Reichenberg that a bit of news is floating through the Continental papers to the effect that at the present time three factories for the production of artificial silk are in active operation. One at Wolston, England, produces 3,000 kilograms (6,613.8 pounds) weekly; one at Besancon, France, produces 900 kilograms (1,984.14 pounds) daily, and one at Spreitenbach produces 275 kilograms (606.25 pounds) daily. Presumably, Spreitenbach is in Germany, but the name does not appear in the lists of municipalities available here.

It is further stated that other factories will soon be erected in Belgium and Germany.

Mr. Guenther, our Consul-General at Frankfort, Germany, reports that Dr. Freund recently delivered a lecture on the manufacture of artificial silk before the Frankfort Society of Natural Philosophy. The doctor said that artificial silk is a substitute for natural silk as much as oleomargarine is for butter. It can compete with natural silk, but is not as valuable. Although it has been used as

a covering for cables and a substitute for horsehair, it has a tendency to break if wetted, and for this reason it must be usually mixed with natural silk and cotton.

More brilliant effects can be produced with artificial than with natural silk, and it is cheaper. It is confidently expected that this industry, which is a purely chemical one, will become highly developed.

### A NEW GERMAN INDUSTRY

THE business of manufacturing building stone by a new method has just been established in Germany on a paying basis. The process employed seems to be exceedingly simple, and the industry apparently has a great future before it, not only in that country, but elsewhere.

The ingredients of the stone are nothing but lime and sand, in the proportion of from 4 to 6 per cent. of the former to between 94 and 96 per cent. of the latter. The ratio varies according to the quality of the sand. The materials having been mixed thoroughly and shaped into blocks of the desired size, the latter are thrust into a boiler that is subsequently closed hermetically, and subjected to the influence of steam at a pressure of from 120 to 150 pounds to the inch. This operation lasts about ten hours. The consolidation of the lime and sand is effected not only by mechanical force, but by chemical action. Nor is this chemical action the same as that which occurs in making mortar. The calcium of the lime unites with the silica of the sand to form entirely new compounds. These are of a flinty character, and give the stone peculiar hardness.

The American Consul at Magdeburg institutes a comparison between the advantages of this industry and of brick-making. He declares that a bigger output of sand-and-lime stone than of brick is possible with the same investment of capital. The plant can work at all seasons of the year. The stone is harder than brick, and does not waste through breakage. It has a higher compressive strength, too. No drying sheds are required. And the granulated cinder from blast furnaces can be used instead of sand.

### THE PALM TREE INDUSTRY

THOMAS D. EGAN, the largest dealer in palm trees in New York, recently told the editor of The Sun how palms had been generally distributed throughout the country for use in homes and churches. According to this authority real palms have not been used at all generally in churches until about twenty-five years ago and less. He says:

Before 1876 the New York churches used sprigs of cedar, hemlock or pine. The Sunday before Easter that year I happened to be in a church at Charleston, S. C., and while there I saw for the first time real palm leaves in profusion as the decorations for the altar. Large branches of the palm were blessed and distributed to the people.

After the service I learned that the leaves came from trees which grow in profusion on the South Carolina islands. I thought that if churches in South Carolina could have real palm leaves New York ought to be able to have something better than substitutes. The next year I began importing the palm leaves to this part of the country. That year I was able to ship only 4,000 of them. The demand for them surprised me.

Since that time the shipping of the leaves has become a real industry. The leaves are cut in January and February, before they have opened up, and the trick of preparing them and preserving them from rot is one which is not easy to learn. In seasoning them the leaves must be kept from the light and in dry air. Between four and six million palms are now distributed for use on Palm Sunday every year.

### RAISING SUN FLOWERS in the WEST

THE raising of sunflowers is predicted to be a coming industry in the West. A western professor of agriculture has experimented with the plants and believes they might be raised upon the great plains of the West with profit and little trouble. In Russia, sunflowers are considered of great practical value. Oil is manufactured from the seeds, the latter are roasted and eaten like peanuts and the stalks are prized as fuel. The sunflower is easily handled in shipping, and it would seem that its cultivation might be a paying experiment. And just imagine the glory of a square mile of sunflowers in full bloom!

### INTRODUCING HUNGARIAN GRAPES

AN experiment in raising Hungarian grapes is to be made near Norfolk, Va. Barth S. Lindsay of Norfolk, Va., is the projector of this experiment. He will at first plant three acres in these vines, and if, after three years, the experiment proves a success, he will establish a larger vineyard. Mr. Lindsay, who has had experience as a vine-dresser in Hungary, considers the climate and soil of this section favorable to the growth of these grapes.

## GAVE UP A DUKEDOM TO RELIEVE THE AFFLICTED

TO retire from the head of a ruling family of Bavaria and devote himself to the science of ophthalmology is the distinction of Duke Charles Theodore. He has already attained such rank in his profession that his clinics are known to scientific men all over the world.

It was the Franco-Prussian war that first turned the duke's mind to the profession of a physician. He took an active part in many of the battles, and became particularly interested in the hospital service, and at the close of the war he announced his intention of studying medicine. Naturally this resolve aroused much opposition in his family. The strongest pressure was brought to bear upon him, but he was steadfast. Willingly foregoing his political rights he entered the clinic of a distinguished Russian professor at Mentone whither he had gone for his health. Thereafter he assisted at various clinics in Vienna, in all of which he was noted for his indefatigable industry and patience, and whole-souled devotion to his work. Eventually he became an independent operator in eye surgery, in which branch he soon gained a high reputation.

Having given his time, the duke now set about giving his money to his profession. On Lake Tegernsee, at the foot of the Bavarian Alps, he built and endowed a large hospital. In this building is maintained one of the duke's famous ophthalmic clinics, to which the afflicted gather from far and near. At Munich, Merane, in Austria, and near Mentone he established other clinics, spending part of the year at each. But it is the hospital on the Bavarian lake that he loves the best, and there most of his time is spent. Dr. Karl Theodor is a spare, scholarly man. He is tall and decidedly lean, his step and athletic movement, however, betraying the influence of those manly exercises of horsemanship and hunting, to which he is devoted in his hours of leisure. His face is earnest, but kindly, his eyes large and blue, with brows prominent and arched, above which rises a peculiarly broad, lofty forehead, which is, perhaps, his most distinctive feature. This notable forehead and the expression of concentrated attention with which he listens to what is said to him about a case are the characteristics which strike the visitor most forcibly.

Dr. Theodor neither receives himself nor permits his assistants in his various clinics to accept material payment of any kind from his patients, regardless of their position. Those who desire to do so can deposit money in a box for that purpose which hangs in the clinic for the benefit of needy sufferers. A helpmate of rare value is the devoted wife of Dr. Karl Theodor, who has so far mastered the details of the clinical practice as to be to him an invaluable assistant. She is accustomed to spend certain hours daily with her husband in his clinic, and by the peasantry is regarded as a ministering angel. Before her marriage she was the Duchess Maria Josefa of Braganza and Infanta of Portugal. She is a beautiful woman, and so singularly youthful in her appearance as almost to excite the envy of her own beautiful daughters. At the clinic she wears a black worsted dress, which, though perfect in fit, is of the simplest make. She is an excellent shot, both she and her husband taking a keen interest in everything which tends to keep up and promote national life. The children of the ducal household are often sent to take part in the village festivities and sports, and the duke offers prizes, and even competes himself, occasionally.

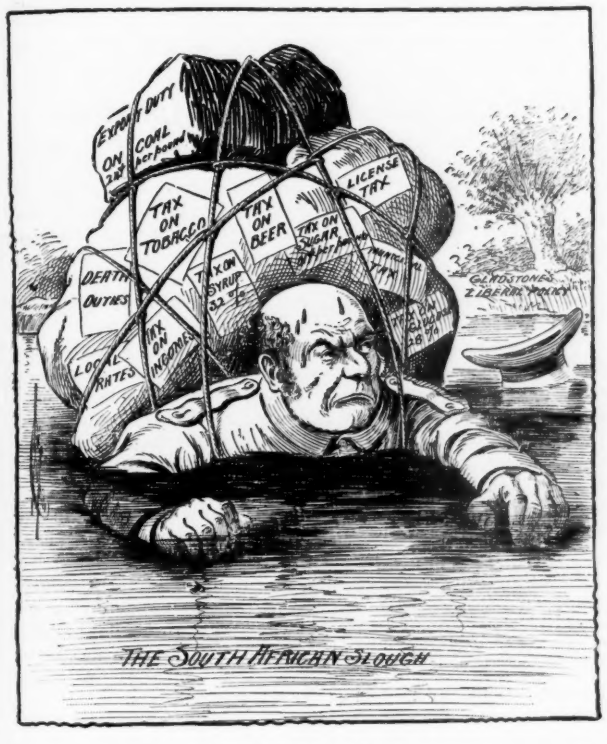
# NICARAGUA THE PARADICE OF CENTRAL AMERICA

## A PEN PICTURE OF THE COUNTRY THROUGH WHICH THE GREAT INTER-OCEANIC CANAL WOULD PASS

THE probability that in time the Nicaragua canal may be constructed lends additional interest to an already interesting country. One who has been a globe trotter and spent much time in that Central American state writes for the Washington Star a special article of much merit. In part he says:

Nature in lavishing her favors on this land left little for the heart of man to desire. Though the country lies in the tropics, almost any climate desired may be found. It is simply a matter of climbing the mountains to the proper altitude above the sea level to find either a perpetual summer, spring, or autumn. There, where nature forestalls every necessity, the primeval curse of labor is a barely perceptible burden. Fruits grow in reckless profusion. Cattle breed and multiply upon the fertile plains, furnishing meat and the material for the clothing, which becomes a mere matter of conventionality rather than of necessity.

One might search far and find no other country about which there is less reliable information than about Nicaragua. It is large as New England, with a population less than that




THE VERGE OF RUIN

John Bull, almost at his last gasp, has Bismark right when he said that South Africa would prove the grave of the British Empire. *Los Angeles Times.*

of Boston, which being said completes the sum of statistical knowledge. There are no reliable statistics. No trustworthy census has ever been taken, and none of any kind for many years. A decade ago the population was estimated at 500,000. Recently it has been put at half that number—a population of easy-going, careless humanity, regardless of today as of tomorrow, for they know that tomorrow will be as today, and today is but a copy of yesterday.

The general configuration of the country has been compared to one's right hand opened with the palm upward and the thumb closed to the side. On the side of the thumb you will have the Atlantic; on the other, the Pacific ocean, while in the hollow of the hand you will hold the great lake. The irregular line at the junction of the wrist called by the palmists the life line will represent the San Juan river, carying off the water of the lake to the ocean. The area of the country is 58,500 square miles, sufficient to maintain a population of a million people. The great lake is a remarkable sheet of water, 125 miles long and from forty to seventy-five miles wide. From the middle of the lake the shore line on either side is invisible. There are a number of islands in the lake, including the two volcanoes, Omepetec and Mederia, which rise to an altitude, respectively, of 5,280 and 4,200 feet. North of this great lake there is another but smaller lake, connected with the former in times of flood.

There is a remarkable difference in the character of the country east and west of the lakes. The mountain sides and the plateaus of the eastern slope are covered with perennial green, while the country west of the lakes during the dry season, January to May, is sere and yellow. Yet it is this western part of the country that is more thickly populated.

Journeying westward from the Atlantic coast, the traveler crosses first the flat lands covered with great forests of tropical jungle. This land is characterized by the black alluvial soil which covers it at a great depth. Gradually the land rises and rocks and gravel crop out of the loam. Settlements are rare and human habitations are far between though the fertility of the land is so great when once cleared of its stupendous growth that corn planted with a sharpened stick grows luxuriantly and no cultivation with either plow or hoe is required. This territory, extending from the San Juan river to Cape Honduras on the north, has long been known as the Mosquito country or kingdom. Its sparse inhabitants constitute a tribe of queer brown Indians, who paint their faces red to scare the devil and indulge in a number of other more or less curious customs and ceremonies. They are a harmless people, under chiefs who make their own laws as occasion requires. When one of their number has transgressed a council is held around their tribal fire and the gravity of the crime discussed and the penalty which the guilty one must pay decided. Usually a fine is fixed. Being notified of the amount, the culprit without demur seeks passage to some port, where, finding employment, he remains till he has accumulated sufficient to pay the fine, whereupon he returns to his people with joy and thus rehabilitates himself.

The Indians of the interior and west coast differ from those of the eastern slope in their attributes as greatly as do the varying aspects of the country. While the Mosquito and other tribes, all more or less related, are a dark brown, bushy-haired people, who have made no progress in the arts of civilization, those of the table lands and the western slope are a yellow race, who at the time of the conquest possessed a civilization closely allied to that of the Aztecs. They are at the present day an amiable, polite, industrious and interesting people, though unprogressive. Their industry is of the most painstaking and in many instances unthinking character. They do things because their forefathers did them, and consequently waste their time in slow and antiquated methods.

The construction of the canal will draw thousands of foreigners to Nicaragua and the effects of this new and heterogeneous element upon its present population is hard to anticipate. There are vast fields awaiting owners to develop them, and indications of gold and silver mines to be discovered and exploited. The immense forests of the Mosquito country with all their valuable timber and rubber are as yet unexplored, and there are prairies capable of sustaining millions of cattle, while on the higher elevations the coffee tree grows in reckless profusion. In such a country, with its thousands of square miles of undeveloped, uninhabited territory, it is not hard to imagine when the difficulties of travel are once removed, the influx of a busy, striving population from the already crowded centers of the old world which shall make of that region, so richly favored by nature, a land of blessing to its civilized inhabitants.

## STEEL TRACKS FOR COUNTRY ROADS

THE Secretary of Agriculture has been making some experiments through the assistance of the Road Inquiry Office as to the utility of a steel track made and laid, so that vehicles without flanged wheels might have the great advantage of a smooth track, heretofore only enjoyed by vehicles with flanged wheels.

The director of the office of road inquiry had recently constructed a sample steel track wagon road for these experiments. It consists of two parallel lines of steel plates, eight inches wide, laid at sufficient distance apart to receive the

wheels of vehicles of the standard gauge. These plates have a slightly projecting slant upward on the inner edge, so as to prevent the wheels of ordinary vehicles which have no flanges from easily leaving the track. These flanges are imbedded in the concrete of the roadbed so as to form a substantial part of it, and the steel plates are supported at every point by a sub-structure of cement or other enduring material.

One of the greatest advantages of the steel wagon road is that the power required to move the vehicle over this road is only a small fraction of that which is required to move the same vehicle over any other kind of road.

As an illustration showing the advantage of such a road it is stated that on a common road twenty horses are required to draw a load of eleven tons, while the same load can be drawn on these steel rails with one horse.

## A VESSEL PROPELLED BY WAVES

CAPT. JOHN S. WATTERS, a New Orleans inventor has found it possible to utilize the force of the waves to propel a vessel. Explaining the principle he said:

It is the fact that a vessel equipped with this apparatus may be headed in any direction, irrespective of the direction of the wind. A vessel so equipped will travel directly against the wind, and thus may be worked off a lee shore—where nine-tenths or more of all sailing ships come to grief. All nautical men will fully appreciate the value of such an invention, for a lee shore is a veritable sailor's nightmare. Not only this, but where a light head wind or a calm is encountered on the ocean, the ocean swell will enable a sailing vessel to continue on her course at a fair speed, instead of wasting time in tacking or lying dead in the water.

Capt. Watters says that the application of this invention to vessels is not at all complicated nor expensive. It is well known that many ships are now provided with bilge keels, the function of which is to steady the ship or retard the rolling. Capt. Watters plan is to substitute for these solid bilge keels others which contain square apertures, and in each aperture firmly secure by its forward end a fin, made of laminated spring material, preferably steel on a steel ship and brass on a wooden or coppered vessel. These fins fill up the apertures almost completely, and, when the ship is steady, offer very little, if any, more resistance to headway than such as is due to a plain bilge keel—merely skin friction. As soon, however, as the vessel rolls, the pressure of the water itself, impigning upon the fins broadside-on or at right angles to their length, springs all of the fins out, and thus deflects the water aft, necessarily, by reaction, forcing the vessel ahead. As she rolls one way, they all spring out with the water pressure to one side; as she rolls the other way, they spring out the other side; returning to their midship position as soon as the roll ceases, which of course removes the pressure. It is an application of the turbine principle virtually, said Capt. Watters, and it may be best understood as being the exact manner in which a fish propels itself. In fact, it was from the tail of a fish that I conceived the idea.

Capt. Watters believes that the application of this apparatus to sailing vessels will increase their average speed not less than 20 per cent., and will give even better results if applied to barges on the Great Lakes. A tow in which each barge has its own motive power, and at such times as the water is very rough, where now progress is particularly slow, the fins will be doing all the better. He also believes that if applied to lightships it will not only relieve the great strain upon their moorings occasioned now by the jerks upon the chains when the vessel is pitched in a heavy sea, but should the ship break away will afford a means of navigating her to port in safety.

## RAISING SILK IN AMERICA

HON. JAMES A. WILSON, the aggressive secretary of agriculture, says that the United States should raise its own silk worms and produce its own silk. In the course of his remarks he made these statements:

I shall ask congress to give me $10,000 for the purpose of making experiments in the raising of silk-worms and the production of raw silk. Last year we imported more than $45,000,000 worth of raw silk, which, according to my notion, might just as well have been produced in this country. Some day, perhaps, we may produce all the silk we require for our own uses, but first it is necessary that we shall learn something more about the business than we know at present.

The raising of a few pounds of cocoons each year does not materially interfere with the household and other duties that now engage the time of the farm girls, and it is by each household raising a few pounds of cocoons that silk culture must be carried on in this country, as it has always been in other countries. In France, I am told, cocoons are regularly produced by more than 150,000 families.

Raw silk is a product of the cheapest labor in foreign countries, it is true, but no country has cheaper labor than we have available in the Southern states, and there is no reason why the people in that section should not turn their attention to picking mulberry leaves and feeding silkworms.

Experiments in this direction have been tried by the government before, and unsuccessfully, but exactly the same thing may be said of tea-raising, which, after a previous failure, is now prospering. We are demonstrating that tea can be grown profitably in the South, the leaves being gathered by children whose parents are delighted with the addition made by the earnings to the family income. This class of labor can be employed to pick mulberry leaves and feed silkworms. High ability to direct the work and cheap labor to execute it afford a combination that ought to make the production of silk a success in the United States.

There are people out in Utah at the present time who are raising silkworms from year to year, growing mulberry leaves for their food, and actually producing silk and weaving it into cloth for family use. It would be a simple matter to employ some of these experienced persons as teachers of the art in the Southern States.

## CIVILIZATION INCREASING INSANITY

DR. FREDERICK J. SIMPSON recently made the astonishing statement that "The neglect of the physical well-being of students has in my judgment caused an increase in insanity and a decrease in the birth rate throughout the United States." This statement was made before the convention of the Association for the Advancement of Physical Education and was immediately taken up by the New York World for a careful investigation. From this investigation it was learned:

Forty years ago there were only 42,824 insane and feeble-minded people in the United States. In 1890 this number had jumped to a total of 202,094. In 1860 there was one insane person to every 728; in 1890 the proportion had more than doubled, being one to every 308. New York state alone has housed in its asylums 21,683.

It is also discovered that colored people are much less liable to insanity than the whites. Out of every 100,000 whites 264 are insane, while in the same number of colored people only 88 are afflicted with diseases of the brain.

A still more serious fact is that the unfortunate creatures who fill our two hundred or more asylums hail from the great centres of civilization and culture, not from the isolated farm or village. For instance, the proportion of insane per million in New York is 3,884, while in some of the smaller towns the proportion is as low as 372.

## REINDEER VALUABLE IN ALASKA

OCCASIONAL newspaper reports have cast reflections on the government's experiment with reindeer in Alaska, but the poor methods of earlier days have been supplanted by wiser ones and now an increasing number of these hardy animals are required. There are a large number of new districts to which the government will send official parties, and it may be that the distribution of the army forces will have to be broadened. In this event it will be necessary to send to all these camps a large amount of supplies. The method of the early miners of carrying what is necessary to eat on their backs is too antiquated for the government, and it is the intention to put the reindeer to use. During the winter now drawing to a close nearly all of this class of animals in the north have been assigned to work for such expeditions, and it is necessary to get others. Lieut. Bertholz was sent by the government to Siberia with a commission to purchase all the reindeer he could get up to 700. Some weeks ago the government was advised that Lieut. Bertholz had left St. Petersburg equipped with the necessary passports authorizing him to purchase reindeer from the natives and proceed with them to the Siberian coast, and he is now coming to the place of rendezvous. It is expected that the first consignment of reindeer will reach Alaska in July, being brought from the Siberian coast by the revenue cutter, the Bear.

# INTERESTING WORK ABOUT A LOBSTER HATCHERY

## METHODS BEING PURSUED BY THE GOVERNMENT TO PROTECT THIS CRUSTACEAN FROM EXTINCTION

FROM time to time the United States Government is called upon to protect some industry from utter extinction. The latest step taken is to preserve the lobster. John Elfreth Watkins, Jr., describes the interesting methods which the government will take. The Maine coast is the favorite haunt of the eastern species and there a lobster hatchery is being erected to cost $10,000. The writer says:

Mother lobster, eccentric creature that she is, coats the outside of her body with her freshly-laid eggs. This she does usually in summer, every alternate year. The eggs attach themselves to little leg-like protuberances on her under side. She coats them with a cement-like substance, which the water immediately hardens. The maternal instinct inspires her thus to glue them fast to her, lest they be lost in the churning sea. She carries them ten or eleven months, before hatching ensues. The minute young break their shells usually in June. All do not see the green glare of the translucent sea, at one and the same time. A week or more elapses between the advent of the first and last born. From the moment the little fellows appear they elect to take upon their own shoulders the responsibilities of life and to paddle their own canoes. They swim off to seek fortune, good or ill, the fostering parent not recognizing them again as her offspring. The number of young which a mother lobster thus produces every two years depends upon her size. If she be eight inches long she produces 5,000 eggs. Thence, the number doubles with every two inches added. Therefore, a ten-inch mother carries 10,000 eggs; a twelve-inch, 20,000; a fourteen-inch, 40,000; a sixteen-inch, 80,000; and so on up to 100,000, which appears to be the maximum.

The new hatchery will collect all egg-bearing mothers obtainable along the Maine coast. It is against the State law for fishermen to sell to dealers lobsters coated with the pregnant eggs. Many, by using a woolen mitten, strip off the eggs, leave them to die in their boats and sell the protesting females as lawful lobsters. But the new hatchery will send out a fleet of little launches, to canvass lobster potters far and wide and pay for egg-bearing lobsters the market price for those which are marketable. Thus will be collected the millions upon millions of eggs to be utilized in the hatchery. Last year the Fish Commission's general hatcheries at Gloucester and Wood's Hole, Mass., thus bought 90,000,000 lobster eggs from which they hatched some 80,000,000 young. But these hatcheries do not devote their exclusive energies to the lobster.

Row after row of seven-quart glass jars, arranged upon tables, will occupy the main hatching room of the new station. Through these series will pass a continuous circulation of salt water pumped from the sea. As the thousands of egg-lobsters are brought in, men skilled in the art will strip them of their beaded coatings. Each operator with his left hand will grasp a fighting creature from above, turn her on her back and lower her, head downward, into a vessel designed for the purpose. Pressing her firmly against its sides, he will prevent her manipulation of her claws. With a dull, short-bladed knife, he will separate her eggs from the hair-like fibers holding them. The subjects of this operation will then be removed to a tank and returned uninjured to the region whence they came. There they will lay again, two years later.

The eggs will now be placed into the incubators—the jars upon the tables. They will be dipped out into glass graduates, each ounce marked whereupon will represent 6,090. About a half million eggs—two and a half quarts—will be placed in each jar. When first introduced, they will be matted together by the fibers connecting them. In a short time they will separate and appear like so many dark green, yellowish-green and light grayish beads intermixed and measuring each one-fifteenth of an inch in diameter. Eggs taken in October will not hatch until May. From those taken in June, the young will begin to appear in twenty-four hours. The sea water must become warmed to early summer heat before they will hatch. In the center of each table, between two rows of hatching jars, will be one row of similar vessels for the reception of the young, passing therein with the circulating water. A cover of muslin, upon the latter jar, will prevent their escape.

Lobster, Jr., resembles a mosquito wiggler—such as seen in rain barrels—just after emerging from his egg. He is a third of an inch long, transparent and slightly reddish. From the outset he is dissatisfied with his birthday clothes. Almost his first act is to shed them. During his first six or eight weeks he throws off his little shell five or six times and grows to be three-fifths of an inch long. By these processes he completely transforms himself, grows legs and claws; assumes an indistinct resemblance to his mother. His eyes are grotesquely enormous and staring. He has remained all the while at or near the surface of the water, being attracted by the brighter light.

Even in his first swaddling clothes he is a blood-thirsty cannibal. He is hungry from the moment of birth and when hatched in the sea feeds voraciously upon minute crustaceans. If he cannot obtain this natural food, he turns upon his brother and gobbles him alive. The great problem of the new hatchery will be how best to supply the little gluttons with natural food to prevent constant repetitions of the catastrophe which betook the Kilkenny cats, who ate each other up.

An artificial pond, stocked with natural food for infant lobsters, may be made an adjunct to the new hatchery. Such protection need last but six or eight weeks, after which the young, now three-fifths of an inch long, goes to the bottom, where he can readily care for himself, hiding as he does beneath rocks and stones. During the year after taking on a weight of one and three-quarter pounds, having molted twenty-five times. His span of life appears to be indefinite. At Sandy Hook, some time ago, a lobster weighing thirty-three pounds was caught. This holds the world's record for size. Its claws were large enough to clip off the arm of a man.

Uncle Sam wants the states bordering the 1,300 miles of lobster coast to aid him in this crusade, and save the lobster from extermination. While he is spending his money on its artificial propagation, he will expect them to enact more stringent laws and enforce them more vigorously than hitherto. The hundreds of millions of young to be annually turned out of the new hatchery will be planted along the Maine coast, where the threatened industry has been most active. There 3,100 men operate 156,000 "pots"—as lobster traps are termed. These are half cylinders of laths, with a funnel-shaped net extending inward from each end. In the center an upright spearhead holds the bait—usually cod, hake or halibut heads. Attracted by this, the lobster reconnoiters around and over the pot, before entering. He always backs through the network funnel. Here he shows the true burglar instinct. He must face any foe which may chance to follow. Were he to navigate forward his claws would hinder his entrance. Once past the fatal threshold, he begins to suspect that the feast before him has been set with sinister motive. He speedily discovers his predicament, and, as a result of the terror which had overpowered him, loses all appetite. He spends the remainder of his time madly pacing back and forth in his prison, seeking a means of escape, but too much excited to realize that he must crawl out as he crawled in. His further history is that the pot is raised from the sea bottom at low water; he is placed with many others of his kind in one of a series of floating, half-submerged boxes; in a few days he is crowded into a barrel kept fresh by ice and seaweed and forwarded to the city markets.

## MARRIAGE PORTIONS FOR YOUNG WOMEN

THE English government has assumed an unusual role in donating as much as $50,000 in a year for marriage portions to young women telegraphers. Women enter the Government Postal Service, mostly as telegraph operators, at an average age of 16. By the terms of the Treasury minute regulating the compassionate allowance scheme, as it is officially and quaintly called, a woman is entitled to the allowance after six years of service. That is to say she has reached the eminently marriageable age of 22 when she is first entitled to her dowry from the state.

For each year of service she can ask one month's pay, but in that matter of pay the benevolent and fatherly state is not wildly extravagant. At the end of a woman's sixth year of service, when she is at her very best as a telegrapher, she probably receives no more than $25 a month, so that if she

should marry forthwith her compassionate allowance would amount to just $150. If that same young woman should wait until she was twenty-eight, she would then be entitled to twelve months' pay, or the maximum amount of allowance, whichever worked out to the smaller sum, the official maximum of benevolence being $400.

As a matter of fact, the average amount paid has been found in practice to be about $200, and there is no reason to believe that it has any direct bearing upon the marriage rate among female civil servants, who, as a rule, do not take husbands who are able to support them in comfort. The majority of these young women marry outside the civil service, their male colleagues being unable to afford the luxury of a wife until they are about 35.

The origin of the marriage portion or compassionate allowance is somewhat curious. About seven years ago it occurred to somebody in power that it would be a good thing if he could manage to provide for his poor female relation at the expense of the state. The idea found favor in high quarters and forthwith the Treasury by administrative decree created a new class of female civil servants, designated "female typist." Appointments were made by nomination instead of by open competitive examination. It was foreseen that the women to fill these posts would come from a somewhat superior social stratum and would in all probability marry after about six years' service, and in order still further to help the poor relations the compassionate allowance regulation was instituted.

There was not the slightest intention to extend this state benevolence to the civil service generally. It was avowedly to be confined to the "female typists," otherwise poor relation. But ere long the women telegraphers heard of the comfortable little arrangement, and forthwith began agitating in order that its benefits might be extended to them. It took less than six months to convert the Treasury, which is a record in civil service agitation in England. They were quick to note that the aristocrats were nervous lest their poor relations scheme should be exposed to the unsympathetic attention of commoner folk with similar incumbrances, and by working on this line they soon obtained the full concession of their demands.

## A SUCCESSFUL STEAMSHIP COMPANY

THE Hamburg American Steamship Company has been cited as an example of the success which an American merchant marine might attain. This German company earned in the year 1900, $6,000,000 net profits, which constituted an increase of $1,500,000, or about 30 per cent. over the earnings of the previous year. The dividend declared to stockholders on the basis of these late earnings is 10 per cent. In commenting upon the conditions of the trade the Directors state that the increase in profits is to be chiefly attributed to the higher earnings of the North Atlantic lines, all of which show a heavy increase in receipts.

Yet, strange as it may seem, such results have all been accomplished without a subsidy. While Americans are hesitating to invest money in such an enterprise without government support, this independent German company has built up the largest merchant fleet of steamers possessed by any company in the world; it has the fastest steamer afloat; it is a pioneer in the work of building a yacht steamer for cruising, and was one of the first to develop the idea of building great freight carrying craft. When the steamships of the line have carried mails across the Atlantic they have been paid for the service, just as all mail carriers are paid, neither more nor less. The fact that they have run some of the fastest steamers has naturally drawn the mail carrying business to them, and, as their payment for mail carrying is determined by weight, this fact may have led to their getting larger stipends than some of the translantic lines running slower steamers.

In the Chinese waters, the Hamburg-American Company agreed, some time ago, to fulfill the contract which the North German Lloyds Company had made with the Government of carrying the German mails, and for this service a certain Government subvention is paid. But, according to the report made to the company, the Chinese branch of its service was the only one the operation of which was attended with unsatisfactory results. There is not the least doubt that, if the conditions were the same here that they are in Germany, if our merchants and capitalists could buy or build their steamers where they chose, we could readily establish and develop a great steamship company, similiar to the Hamburg-American, which would have great steamers running over the principal ocean routes and the smaller steam craft carrying the flag of the United States to all parts of the world. According to the Boston Herald it is not a subsidy that our ship merchants need, but the same freedom of action which the German Government has wisely accorded to its ship merchants, and which they have utilized in building up the shipping tonnage and commerce of the Empire.

## NORTH AMERICA'S OLDEST CITY

ARIZONA, which is soon to enter the sisterhood of states, has within its territorial boundaries a city not only far antedating the American revolution, but also the oldest city in the United States. The Phoenix Republican comments on this as follows:

George G. H. Hilzinger, in his "Treasure Land" presents the facts in sprightly verse and prose:

Ancient in years, but her long life well spent,
She smiles serenely at the face of time,
Sphynxlike she sat, while ages came and went,
The oldest city and the gentlest clime.

"The struggle between Santa Fe and San Augustine on the question of priority of settlement has about worn them out. San Augustine pants on her sandy shore, while poor old Santa Fe grins disconsolately from amid her ruins. Tucson has not, heretofore, claimed anything but climate and prosperity, but now she rises to explain that these two hoary-headed sinners have been wasting their declining years in trying to prove private property in what belongs to neither."

Mr. Hilzinger concedes, for the sake of argument, the claim of Santa Fe that it was settled in 1605. His description of the settlement of San Augustine is noteworthy for its sparkling originality.

"In 1852 Admiral Coligni obtained from Charles IX. of France the privilege of planting a French Protestant colony in the new world, and finally succeeded in establishing one on the River St. Johns, in Florida. The colonists had become comfortably settled when the Spaniards, who classified heretics with agitators, pounced upon them.

"August 28, 1595 (the same year the Spaniards entered New Mexico to Christianize the Indians), Pedro Menedez, with a company of 2,400, descended upon the Huguenots and exterminated them, but left the alligators and mosquitoes.

"Philip II. was then proclaimed monarch of North America or whatever it might thereafter be called, and * * * San Augustin (as it was then spelled) was founded with due pomp and ceremony.

Mr. Hilzinger gives the date of settlement of Tucson as 1555, some half a century earlier than the founding of Santa Fe or St. Augustine. He bases his claim upon authentic documents, including a parchment discovered among the records of the old mission of San Xavier.

## RATS AS CONVEYERS OF PLAGUES

DR. W. NAGUSHA, eminent Japanese bacteriologist and scientific investigator, is preparing a general extermination of the rats of Japan and he is traveling around the world to discover the best way to accomplish that result. In Chicago he said:

Rats are the conveyers of all the scourges of the world. My government has already offered rewards for their killing, and is only awaiting the devising of practical ways and means for the destruction of the vermin to undertake their total extinction. The government may ultimately propose an international rat crusade in order to compass the world extermination of all varieties of the rodent. Not only am I convinced by practical observation that rats are the medium of infection for the plague, but also for cholera and many or all other earth scourges. Serum, sanitation, isolation and all other means are good as methods of prevention, but the death of these great bacteriological pests can only be accomplished by the death of the rat. That is the conclusion the world of science is rapidly coming to, and I look to see the day when the powers of the world shall unite to make war upon what costs them more than armies and navies. If the rats were cleared out, exterminated, not only would the danger of disease be abrogated, but incredible wealth saved."

# THE CONSTRUCTION AND LAYING of AN OCEAN CABLE

## PROBLEMS TO BE FACED AND OVERCOME BY EACH COMPANY WHICH PROMOTES THE ENTERPRISE

THE proposal to lay a great Pacific cable has renewed the interest in this subject throughout the world. It is hard for us to realize that the cables have come into being within the memory of people now living among us, for ocean telegraphy is as ordinary a factor in our everyday lives as the mails or the railroads. The battlefield of Waterloo was but nine miles from one of the most brilliant cities of Europe. It was but a short distance from Berlin, Paris and London, the capitals of countries whose national existence was staked on the issue of the battle, yet anxious days elapsed before the result was known, and America learned of the final overthrow of Napoleon only after two months had elapsed.

Before the close of the century the battle of Manila took place in one of the out-of-the-way regions of the earth, and the papers the next day told the tale in every city in the civilized world. Events in China or Central America are told as fully as those of the next town, and thanks to our longitude, we sometimes know of them apparently before they happen, for the messenger makes Old Time seem slow.

This has been the effect of ocean telegraphy, but in spite of the constant use made of it, there are few things in our modern civilization that are less understood than the cables. Most people think that there is no more difference between submarine and land telegraphy than there is between the overhead and underground systems of operating trolley cars, but this is a mistake. The problems are absolutely different, and there is no more resemblance between them than there is between a horse car line and a great railroad system. Both systems of telegraphy use wires and electricity, as both of the others use rails and cars, but the objects, methods and materials are radically different. On land the wire that carries the current is supported on poles high enough to get it out of the way of most things that would be likely to molest it. The wire is not allowed to touch the poles or anything else that might steal the electricity, but every contact is insulated by glass or porcelain. If some accident happens that interrupts the service, the break is readily found and easily repaired, and if experience shows that the route first chosen is an unsuitable one, another can be found with comparatively little trouble and expense. The chief things that imperil a land telegraphic line can be seen at once.

It is otherwise with a cable. It must rest on the bottom and be surrounded by water or wet mud. It must therefore have its wires thoroughly covered with some material that will not transmit the electricity and through which the sea water cannot penetrate, for the utility of the cable depends on perfect insulation. If it be injured the spot can be found only by difficult calculations, and when found the cable must be grappled for and raised to the surface through miles of water.

The early projectors of submarine cables had to face a difficulty that is based on the nature of electricity itself. Every one knows that if an electric current meets with resistance, it develops heat, as in a common incandescent light. There is no substance known that is a perfect conductor, but even the best offer more or less resistance, and so weaken the current passing through them. On land this is overcome by making the lines continuous only for short distances, and having "relays" that start fresh supplies on the next stage of the journey, but of course this cannot be done on a cable, and electricians were puzzled to find some way to send a current through thousands of miles of copper wire and be strong enough at the other end to move an instrument without being so powerful as to burn the insulation at the start. When this problem was solved, it was found that with the best that could be done, the current was too weak to affect an ordinary Morse receiver, so a new system had to be devised with instruments of exquisite delicacy and sensitiveness.

When a new cable line is projected, the first thing to be done is to survey the route and select the best bed for it. This is of vital importance, as can be seen when the structure of the cable itself is understood. In principle a cable does not differ from the insulated wires that are used in houses for telephones or electric lights; the only thing being that the cable is larger and more elaborately protected. It is composed of a "core" of wire that is the essential part of the whole, as it carries the electricity, and an envelope of non-conducting material. The core is made of copper strands woven into a rope-like form that weighs from 70 to 400 pounds per mile. The shore ends that have to stand the beating of the surf are much thicker and heavier than the deep-sea portion, and this accounts for the great difference in weights. The first cables had cores that were really rods of copper, but it was found that the stranded form is much more flexible and less liable to be broken. The core is coated with a mixture of Stockholm tar, resin, and gutta percha known as Chatterton's compound, that acts as a cement to fasten the insulating jacket to the copper.

There are few things that will answer for this insulation, as it must fulfill many requirements. It must be a non-conductor so as to check "leakage" as far as possible; it must be able to resist the action of sea-water; it must be of such a nature as to be easily applied to the core; it must not be liable to decay, and, finally, it must be flexible, to permit the cable to be coiled into a comparatively small space on shipboard and to be reeled out without cracking the envelop.

Miss Columbia (to her fair neighbor)—Wont you join the stars and be my forty sixth? *The Chicago Record-Herald*

So far only one substance has been discovered that fulfills all the conditions. This one is gutta-percha; but while it is perfect for the purpose, only a small amount of it is available. It should not be confounded with India-rubber, for it is a far different substance. Gutta-percha is gotten from a family of trees that will grow only in a small area about the Malay peninsula and they have not been raised elsewhere with any success. The tree cannot be tapped as maples are to get the sap, but they must be cut down and the juice expressed by beating with heavy mallets. The native gum hunters manage to get some two or three pounds of the gum from an average tree, and as none are planted to replace those that are felled, and the trees are of very slow growth, the source of supply will be a grave question in the near future.

Some of the misfortunes that have befallen cables are curious. They have been bitten in two by sharks, and cut to pieces by sword-fish. A whale became entangled in one and broke it in struggling to get free; anchors have often damaged them near shore, and the so-called shim worms are formidable enemies. These pests bore through the insulation

and fill it with myriads of little holes that can hardly be found, but absolutely ruin the working of the line. The companies that own the cables in Asiatic waters suffer from these enemies more than from anything else, and their cables are covered with phosphor bronze to baffle the attacks. This is an expensive expedient and one not altogether successful, so it is found better to select a route that will be as free as possible from such dangers.

The finding of a route is the most difficult thing connected with submarine telegraphy. The earth is as irregular in the parts covered by the sea as it is in the land areas, but few people who are not scientists think of it, and a cable can no more be laid anywhere on the sea floor than a railroad could be run at random on land. The road must be discovered, and the only means of finding it is the sounding rod.

The rod generally used in the United States was invented by Capt. Charles D. Sigsbee, formerly in command of the unfortunate Maine, and is an improved form of the one devised by Prof. J. M. Brooke, now of the Virginia Military institute, but at one time in the United States navy. Without going into technical details, it may be described as a brass cylinder running through a perforated shot that is so arranged as to be released when bottom is reached. The weight of the shot carries the rod down, but it would put a severe strain on the wire if it were pulled up, so the shot is left on the bottom and only the rod is recovered. The line is of piano wire, and as the rod descends it is paid out from a reel that registers every revolution and thus shows the depth, as each turn pays out a known length. The rod is arranged to sink into the mud at the bottom and gather a sample that is retained by valves until the rod is safely on board the vessel. Besides the rod the line carries a thermometer made so as to be unaffected by the pressure oi the water and to register the highest and lowest temperatures it may encounter, and also a bottle invented by Capt. Sigsbee that collects a specimen of the water near the bottom. By means of these instruments each sounding gives the depth of the water, its temperature, a sample for analysis and a specimen of the bottom, and it is from these data that the cable engineer determines his route.

The sea is far from being thoroughly known, but the various exploring parties that have been sent out from time to time have given a fairly good idea of the depths and the character of the bottom along the main lines of travel. From the materials already collected, it is possible to say what approximately will be the route, and when this is done the survey is organized. A vessel equipped with the sounding apparatus steams slowly over the proposed course and makes soundings at such intervals as the conditions may indicate. If the depth and nature of the sea floor are uniform and regular, the soundings need not be as frequent as they would be where the bottom is rough and uneven. The depth of the water is recorded after each sounding, and from them a profile is prepared that shows the elevations and depressions. A steep slope is to be avoided if practicable, for the cable will tend to slip and throw a dangerous strain on the upper portions. A narrow ravine is dangerous in the extreme, as the edges may chafe the insulation or even cut through the core and all, and as such obstacles cannot be bridged, they must be evaded. If such a difficulty cannot be passed without going around it, the route must be abandoned and another one sought.

The material brought up in the rod is of great value in showing what is the state of things at the floor. Close to shore, where the water is not over one hundred fathoms deep, the bottom is made of the waste of the land, and curious things are sometimes dredged up, but when the "hundred fathom line" is passed, a bottom is found that owes little to the coast. Over a large part of the sea, it is a grayish powder called "ooze" that is made of the tiny shells, or tests, as naturalists call them, of little beings that lived in the water and fell to the bottom after death. The tests fall like snowflakes all the time, as they did in bygone ages when the limestone beds were formed, and layers hundreds of feet thick are gradually built up. Ooze is the best kind of a bed for a cable as it sinks into the fluffy mass and is protected from harm. Ooze shows still water, for it is so light that even a very weak current would carry it away as wind sweeps snowflakes and if the bottom sloped steeply the ooze would slip off, so when it is in the rod, the indications point to still water and a smooth bottom. A hard floor of clay, sand or gravel indicates a current that might be dangerous.

In some parts of the world submarine volcanoes are found, and, as a cable would fare badly near one of these, they must be detected if possible. A sudden rise of temperature as shown by the thermometer, is a warning, and if the rod brings up bits of lava of volcanic ash, that vicinity is given a wide berth.

If any insurmountable obstacles is found another route must be tried, and these trials may take years, but when a telegraphic plateau is discovered, a great step in the advancement of the human race is made. The Pacific is the only sea that is not yet crossed by one of these links that bind civilization together, but the results of the surveys of the Albatross and the Thetis may make the laying of the Pacific cable an assured fact.

## STATE AID FOR THE CURING OF CONSUMPTION

AN agressive movement to save the lives of consumptives has been started in Pennsylvania and some other states. Dr. Lawrence F. Flick, president of the Free Hospital for poor consumptives, thus outlines what he thinks the state should do:

It must be borne in mind that a consumptive has to struggle for his existence against the disease that is afflicting him for a period of from three to five years, and that during this time, if he is to have any chance of recovery, he must be free from worriment and overexertion, must have ease and comfort, plenty of nourishing food of an expensive character, and medicines, most of which are costly. It can be safely said that at a certain period of the disease nothing stands between recovery and the average consumptive except the means of securing the proper treatment and environments of life.

The project of establishing a free hospital for poor consumptives in the mountains aims to benefit consumptives who belong to the working classes principally, and who by reason of their stinted resources are incapable of successfully struggling against the disease. Laborers, journeymen, clerks, salesmen and saleswomen, domestics, factory employes and all such like, whose income varies from $4 to $12 a week, are practically helpless under existing circumstances when stricken with tuberculosis, and go down to their graves simply because no helping hand is extended out to them to save them. In the beginning of the disease most of these cases could be saved if given treatment in a properly equipped sanatorium, and even many of those who have advanced in the disease to a considerable stage of progress might be restored.

In Germany, where during the last few years, through the aid given by life insurance companies, a large number of sanatoria have been established, about 40 per cent. of the cases treated are restored to lives of usefulness. As time goes on, and a better understanding of the subject is attained, even better results than these will be brought about, because persons afflicted with tuberculosis will apply for treatment at an earlier stage of the disease. In Pennsylvania we have at the present time probably from 10,000 to 12,000 people afflicted with tuberculosis, all of whom are destined, under existing circumstances, to die within the next few years. Of this number from 4,000 to 5,000 could be saved if we had properly equipped sanatoria in which to treat them.

One of the reasons for the present activity throughout the civilized world in the establishment of sanatoria for the treatment of consumptives is to be found in the possibility of exterminating the disease by this measure. That consumption will be stamped out in all civilized communities in a comparatively short period of time is not only theoretically assured by science, but is practically proven by what already has been accomplished during the last few years. In Philadelphia, for example, we have had a reduction in the death rate from consumption of nearly forty per cent. since 1884. According to our statistics, there was one death from consumption in the city of Philadelphia in 1884 for about every 300 people living in it, whilst in 1900 there was only one death from consumption for about every 500 people living in it. This wonderful result has been brought about by education and such hospital aid as could be given with the very limited resources which have been provided by private charity. The strides in the reduction of the death rate would be more rapid were state and city aid given to the work. That this will be given there can be no doubt, so soon as the subject is thoroughly and properly understood.

# NATURAL GAS IN THE UNITED STATES

## GREATEST GAS FIELDS OF THE WORLD IN AMERICA, BUT SUPPLY IS APPROACHING EXHAUSTION

REPORTS of the discovery of new oil fields in Texas, Utah and California have been read with great interest, not only by people who are interested in the oil business, but by those who had read of the great falling off in the supply of natural gas in the United States. Gas is only found where there are carbonaceous deposits, such as coal or petroleum, and more oil usually means more gas. When the coal and petroleum have been taken from the earth and the supply of these has been exhausted the gas supply also vanishes. The gas reservoirs or gas-bearing rocks are in the paleozoic strata from the upper coal measures down to the Trenton limestone, and every richly productive gas well is an inverted trough of coarse-grained limestone or sand, covered with a deposit of shale or similar formation. These gas furnishing reservoirs vary in area from a few square miles to the great arch over five thousand square miles in area, which covers the Ohio and Indiana gas belts. These gas reservoirs are not great caverns in which gas has been stored by nature to be tapped and piped by man, but simply porous rock formations impregnated with gas. The more porous the rock the quicker in the consumption after the drill has once made a passage for the gas to the surface.

"Eternal fires" on the shores of the Caspian Sea, fires from the earth in the province of Sze-Chuen, in China, "holy-fires" that have burned for centuries in many parts of the Orient, and gas wells that have burned in Russia for generations, show that these reservoirs exist in all parts of the known earth, but the United States is recognized as having the greatest gas fields in the world. Since natural gas was discovered and utilized at Fredonia, Chautauqua county, N. Y., in 1821, this substance has played an important part in the United States. The little town of Fredonia was illuminated with the natural product in 1824 when Lafayette visited the place, and the well which was drilled in 1850 to a depth of fifty feet supplied the village with natural gas until 1858.

Since then Pennsylvania, Indiana, Ohio, West Virginia, and New York have become sources of supply, and at last accounts there were upward of thirteen thousand miles of pipes in the United States used exclusively for conducting natural gas from the wells to factories and houses. Of this pipe system Pennsylvania has 5,354 miles; Indiana, 4,399; Ohio, 1,799; West Virginia, 893, and New York, 414. It would require $14,000,000 worth of coal to produce the heat and light given by the gas which passes through these pipes in one year. The cash value of the natural gas supply for 1897 was estimated at $12,754,370.

The value of natural gas in the United States in 1898 was estimated by statisticians at about $15,300,000. This was exclusive of the Canadian gas, which at that time came in large quantities to Buffalo and Detroit. In the same year large and important natural-gas discoveries were made in Ohio, West Virginia and Pennsylvania. The uses to which natural gas is put were tabulated recently, and from records secured it appears that 571,998 "domestic fires" are maintained by this natural fuel, 34 iron mills, 10 steel works and 154 glass works derive heat for manufacturing purposes from natural gas, and 3,314 consumers are placed under the general head of "for other uses."

The United States Geological Survey's recent report shows that the natural gas supply has fallen off in the United States in its fuel value about one-third. In 1899 the production of natural gas was equal to the heating capacity of 5,400,000 tons of coal; ten years ago, when the industry was at its height, the equivalent of the heating output of natural gas was about 15,000,000 tons of coal. The government experts, after making careful examination, declare that the great gas-producing fields are approaching extinction. The Ohio division, the supply from which once had a pressure of 480 pounds to the square inch, has now no such pressure, and the original rock pressure of 325 pounds in Indiana has been reduced to 165 pounds. The consequence is that many industries in Indiana, where natural gas was used, have been discontinued, or are working at a disadvantage, or have substituted coal.

The aggregate value of the gas produced in 1899 was $20,024,864, a gain of $4,730,051 over 1898. This was due to an increased demand, and to an increase in the cost of the product. Despite the fact that wells were allowed to burn for months simply to attract attention to the places where they were found and to help "booms," that in cities where natural gas was used for illuminating purposes lamps were never extinguished, that gas wells were set on fire "just for fun," and other wasteful practices, the resources of natural gas are still enormous. But the exhaustion of many large wells and the diminution in the pressure have been taken as warnings. Consumption is regulated, and new fields are being opened. "But the time is coming," says the gas expert, "when no more gas fields will be left undeveloped, and the supply will have to be carefully husbanded."

The United States Geological Survey reports show that the demand for natural gas has increased and that the number of wells opened is smaller than ten years ago, while the supply of the old wells has declined. The city of Chicago is supplied with about 20,000,000 cubic feet of natural gas from the Indiana region daily. It comes through three mains—one 10-inch and two 8-inch. The average pressure throughout the state of Indiana is said to be about 181 pounds to the square inch. A note of alarm came from the state geologist who said that when the pressure drops to 100 pounds to the square inch the wells will become useless. Nearly all the Indiana wells draw their supply from a depth of not less than 1,000 feet.

Detroit has been supplied with natural gas for several years from the Canadian fields at Kingsville. Last winter the flow, however, diminished perceptibly, but with the return of warm weather the supply appeared to be as abundant as ever. This winter, however, the pressure has fallen until it is so low that the use of the gas in factories, and even for domestic heating purposes, has had to be given up. At present there is practically no supply at all. New wells will be sunk at Kingsville in the hope that a new source of gas at a greater depth may be struck.

There are more wells in Pennsylvania than in Indiana, and they supply light and power to more cities, towns and factories than those of any other part of the country. The product of gas in that state was valued at $20,000,000 in 1888. But according to the New York Tribune the supply has been decreasing and the demand increasing. The product of 1897 was valued at a little over $6,000,000. Of the three thousand gas wells in Pennsylvania, at least one thousand have been abandoned. In some places the pressure has fallen so low that gas pumps must be used to keep up the supply. With the falling off in the supply came measures of economy. Meters were introduced, and one cubic foot of gas now accomplishes all that three feet did in the days when the stock was looked upon as inexhaustible.

The discoveries of new gas wells in West Virginia, where it is obtained at a depth of from 1,200 to 2,000 feet with good pressure, are pointed to by the people who believe that there is no danger of a natural-gas famine within the next half century. This gas is sent by its own pressure through about thirty-five miles of 36-inch pipe, and then into smaller pipes to Pittsburgh, where it is used not only for open hearth and crucible melting and in the improved furnaces, but for heating homes and for cooking. Pittsburgh was formerly supplied with natural gas from a point only twenty-five miles away, but is using more now, although the source is much farther away. In the year ending March 31, 1900, the Philadelphia company delivered from West Virginia to Pittsburgh 16,671,297,000 cubic feet of gas. This was obtained from territory covering 130,865 acres of land, with 416 producing wells and 1,033 miles of pipe line.

## PICTORIAL NEEDLEWORK from PORTO RICO

THE prize for expert needlework at the Pan-American Exposition may be awarded to a Porto Rican lady, Miss Davila, who has made a portrait of Washington, which is at once an excellent likeness of the Father of his Country, according to accepted portraiture, and an example of the finest kind of delicate work with the needle.

The composition of which the portrait is the center, is enclosed in a massive gilded frame and is in itself a very curious and interesting piece of work. It consists of flowers and leaves, in beautiful forms, very skilfully cut out of undressed feather, and deftly pinned together. The foundation of the

composition is white China silk, stretched tightly against the back of the frame, and draped upon this, in graceful folds, is an American flag, with a gilded staff, which is ornamented by a spear-head and golden tassels. The red and white stripes in the flag are broad satin ribbons, sewed together, and the union is a square of blue satin, upon which the stars are worked in white silk. Imposed upon the flag is an escutcheon-shaped shield of white taffeta, and on this is executed the portrait of Washington, with a facsimile of his familiar autograph worked in black silk underneath. The words "First in War, First in Peace, and First in the Hearts of His Countrymen" are inscribed upon the shield in a similar manner.

Miss Davila made a much-enlarged drawing from a cabinet photograph, representing Washington as he appears in his best-known portrait, by Gilbert Stuart, and upon this she executed her pictorial needlework. She had determined, she says, to show how far needlework could go, firmly believing that she could accomplish with the needle whatever could be done with pen or crayon. The result is truly remarkable. At first glance, the portrait appears to be a fine steel engraving, and, so far as the face is concerned, this impression remains after the closest scrutiny, the innumerable minute stitches being imperceptible. So skillful is the blending of the black and gray silk threads, of hair-line fineness, upon the white background, that the delicate shades of steel engraving are perfectly reproduced. Even the expression of the eyes is denoted with the life-likeness of the best steel engraving, while the wrinkles in the forehead and the texture of the fluffy, powdered hair are faithfully depicted. As a likeness of its subject, the needlework is far more realistic than the photograph which served as the basis of the design.

## EUROPEAN SAFE-GUARDS AGAINST PREMATURE BURIAL

EDWARD P. VOLLUM, M.D., a Colonel in the United States Army, has been making a special study of apparent death. In a communication to the Washington Post he takes up this subject fully and concludes it with an outline of protective laws which he thinks should be enacted:

It is natural, he says, for organized living beings to become torpid or apparently dead and revive again, from causes that are natural, pathological, or from violence. In the lower creatures there are the familiar states of hibernation and the torpor from freezing and climatic dry heat, which pass away with the changes of season. Mankind on account of their complicated anatomy more easily fall into torpor or apparent death. Any one whose vital machinery is thrown out of gear by excesses, strains, or depressing causes may pass into and out of this transitory state if they have a reserve of strength. Shocks cause apparent death, such as from gunshot, strokes of lightning, charges of electricity, concussion, heat and sunstroke, fright, intense excitement, etc. So do exhaustions from mental and physical exertion, especially in the badly nourished, asphyxia from various causes, intense cold, anaesthesia, intoxicants, hemorrhage, narcotism, convulsive disorder, so-called heart failures, and apoplectic seizures, epilesy, and syncope.

The above cases are quite plain, and many are saved by medical aid. But there are other forms of this mysterious state that may defy the highest medical skill and all known tests and signs. These are the constitutional cases, due to some warp of temperament, as seen in trance, catalepsy, cholera, auto-hypnotism, somnambulism, etc., which like hibernation, are inexplicable to any principles taught by science. We know but little of these idiosyncracies except that they are usually hereditary, and that their victims easily fall into a death-like lethargy from overwork, worry and foul air, and that during their attacks efforts at resuscitation should be kept up until putrefaction appears, lest they be mistaken for dead and disposed of accordingly.

Between 1780 and 1800 Europe was agitated on this subject. France first recognized the necessity for legal protection against these dangers. Germany was the first to put them in force. Then followed France, Austria, Belgium, Spain, the Netherlands, and Scandinavia. The pith of these laws is, in the requirement of an expert examination of the apparently dead independently of the attending physician.

The German system is best seen in Munich. This city of 48,000 people is divided into twenty-one burial districts, in each of which there is an inspector of the dead, with an alternate, besides the women who make the toilet of the body, called leichenfrau, and who arranges the funeral appointments. She is also qualified by a technical examination. The attending physician is always present at the death crisis. He gives his verdict of death, but the law does not trust his unsupported opinion, however famous he may be. The inspector comes, and in the meantime nothing about the body must be touched by any one. He makes his certificate, which covers every possible point in the case, and this is countersigned by the attending physician. Delay and resuscitation may be employed at this stage if the inspector sees fit.

There is no law in force anywhere in America that requires either physician, undertaker, or embalmer to employ any specific means to decide that life has left the body before it is placed on the ice, embalmed, buried, cremated, or submitted to autopsy. As a rule, the appearances of death are accepted as conclusive.

In the absence of protective laws, which long experience in the old world has proved to be necessary, it is possible for a physician to give a certification of death to any one, without his knowing anything about the case, whether there was actually a case of death or not, or whether it was a case of homicide, contagion, poisoning, or malpractice. Protective laws in the United States should embody the following provisions—namely

1. To determine if a body be dead in order that no one shall be placed on ice, embalmed, autopsied, buried, or cremated who is apparently dead.

2. To prohibit any operations upon the body that might cause pain, efface important appearances, or add deceptive ones, without the permission of the attending physician or coroner.

3. The identification of the body; registration of a certificate of verified death, giving proofs of dissolution found on a personal examination of the body, by a qualified physician, before the issue of a burial permit.

4. To ascertain if persons died from natural causes, of certain diseases, or from accidents, suicide, crime, neglect, ignorance, or contagion.

5. To provide materials for statistics of mortality; to furnish proof of the fact and cause of death or the use of life insurance claims; in pension cases, in order to assist the honest and to prevent the false ones; and to guide expenditures for public health purposes.

6. To require all cemeteries to provide waiting mortuaries for the detention of bodies—contagious cases separated—under medical supervision, until putrefaction appears, excepting cases which have been embalmed, autopsied, or with injuries to the vital apparatus.

7. To fix penalties for violations of these provisions.

In view of the fact that careful estimates place the number of premature burials at from one to two in a thousand the subject becomes important.

## HOW THE WELLSBACH MANTLE IS MADE

THOSE who have marveled at the beauty and perfection of the Wellsbach light have often inquired how the thin, woven "mantle" was produced. A writer in Keystone gives some facts which will be of special interest to such observers:

The "mantle" of the Wellsbach light is an ash consisting mainly of the oxides of certain rare metals—lanthanum Zirconium, etc., which are rendered incandescent by heating to a high temperature. A six-cord cotton thread is woven on a knitting machine into a tube of knitted fabric of a rather open mesh. This web has the grease and dirt thoroughly washed out of it, is dried and is cut into lengths double that required for a single mantle. It is then saturated in a solution containing the requisite oxides, wrung out, stretched over spools and dried. Next, the double-length pieces are cut into two, the top of each piece is doubled back and sewed with a platinum wire, which draws the top in and provides a means of supporting the mantle, when finished, from the wire holder. After stretching the mantle over a form, smoothing it down and fastening the platinum wire to the wire mantle holder, the mantle is burned out by touching a Bunsen burner to the top. The cotton burns off slowly, leaving a skeleton mantle of metallic oxides, which preserves the exact shape and detail of every cotton fiber. The soft oxides are then hardened in a Bunsen flame. A stronger mantle is made upon lace-making machinery.

# NOTABLE UTTERANCES OF OUR DAY

### CHINESE CIVILIZATION

HON. WU TING FANG, the Chinese Minister to the United States, in a recent public address took occasion to defend the civilization of China in these words:

It must be admitted that today China is centuries behind the age in her knowledge of chemistry, electricity, steam navigation, rapid transit and other arts and sciences. All these things she must learn from other nations before she can hope to put herself abreast of the times.

But does civilization consist of railroads, telegraphs, telephones, electric light, battle ships, rapid-firing guns, magazine rifles and a thousand and one things which are often regarded as necessary for a progressive nation? This would be a very narrow interpretation of the word. Civilization has, I believe, a broader meaning, with intelligence, order, morality and refinement for its essential elements.

Such a civilization China undoubtedly has, a civilization different, to be sure, from that of the west, but a civilization, nevertheless. Chinese ways are not necessarily bad because they often seem strange to western eyes. It is merely a question whether one is accustomed to them or not.

That occidental civilization in all its phases is superior to oriental civilization is not clearly established. The burden of proof is on the side that endeavors to effect a change in the existing order of things. The mere assertion that one system is superior to the other is not sufficient. Sixty years of foreign intercourse have by no means convinced the Chinese that western ways and methods are better than their own in all respects and under all conditions.

China's requirements are peculiar to her position among nations and to the growth of her national life. By adopting from the west only what is best for her welfare, and avoiding everything that is not suited to the conditions and needs of her people, she will transform herself into a modern nation without losing those elements of national character which have made her great and strong in the past.

### DANGER IN EARLY MARRIAGES

JUDGE FRANK E. DELLENBAUGH, in the divorce division of the Common Pleas court at Cleveland, O., stated these important conclusions as the result of his experience:

Two-thirds of the divorce cases that come before me are due to early marriages. I believe that the same would hold true in all divorce courts. Young people marry before they are old enough to form sensible views on matrimony or on the character of those they marry. There have been young wives here weeping for divorces who must have been so young at the time they were married that spanking would have been more appropriate. Young men are as great fools as young women.

There is another class of foolish marriages in which matrimony is contracted before the parties have been acquainted long enough to know each other thoroughly. These hasty and unfortunate marriages are usually contracted by very young persons, so that it comes back to the same proposition of too early marriage. When the injudicious marriage has been made there is nothing left but a life of misery for each of the parties to it or the divorce court, and so the divorce records keeps growing. It is shameful, and the lessons of the divorce court ought to teach young people who are in a hurry to get married to go slow.

### WOULD UNITE CLASSES

IN the course of an address Dr. C. W. Chancellor of Washington made some remarkable suggestions, which, if adopted, would prove of the highest importance in alleviating the distressing situation and general spirit of unrest among different classes of society. He said:

For many centuries there were but two classes among the Romans—the patricians and the plebians. To prevent all cause of dissensions a band of union was established between these two orders by a reciprocity of services, and corresponding obligations under the name of 'patronage' and 'clientship.' By this arrangement the two parties were mutually bound to help and defend each other according to their relative condition and the nature and exigency of the case, and so sacred was this obligation that the patrons watched over the interests of the clients and the clients over those of their patrons as if they had been respectively parents and children.

There is, of course, no such thing as absolute perfection, but such a relation existing between the two great classes of human society is the surest safeguard against those influences which threaten to dry up the human sympathies and make the nation a seething caldron of unrest and unhappiness.

Production begins with the hands of the laborers, and without their labor there could be no capital. It is, moreover, sufficiently evident that without saving there could be no accumulation of wealth. That which is produced, but not immediately consumed, which is saved and set apart for another purpose, becomes an article of capital, and this saving is effected through capitalists. Whether they want it or not capitalists are the trustees of those who labor, and execute their trust, some with more, some with less fidelity; but on the whole the duty is performed, and everything returns in the course of time, with only some trifling commission and discount deducted.

### HELEN KELLER ON COLLEGES

HELEN KELLER, the deaf and blind student, writing an article for Radcliffe's magazine, on her experiences as a college student, makes these remarkable statements which other college students will readily corroborate. She says:

There are disadvantages, I find, in going to college. The one I feel most is lack of time. In college there is no time to commune with one's thoughts. One goes to college to learn, not to think, it seems.

When one enters the portals of learning one leaves the dearest pleasures—solitude, books, imagination — outside with the whispering pines and the sunlit, odorous woods.

It is impossible, I think, she concludes, to read four or five different books in different languages and treating of widely different subjects on one day and not lose sight of the end for which one reads, mental stimulus and enrichment. When one reads hurriedly and promiscuously one's mind becomes incumbered with a lot of choice bric-a-brac for which there is little use.

### BOOKER T. WASHINGTON'S ADVICE

AT the great negro conference in Tuskegee this spring Booker T. Washington made some comments which deserve preservation. He said:

Let us not pull anybody down but lift others up. Cotton has brought a good price, the temptation will be to spend it freely for things we do not need. The big picture man is going around among you. I have heard of one poor old house that has thirteen of these big pictures in it, costing about $3 each. One man paid $35 for lightning rods on a house that was not worth $25. Some rented houses have big organs and pianos in them with no one who can play them. Build your house first. When you have educated your children so they can play, when you own your house and pay taxes, then buy your piano and organ.

Then there is the cheap clock man, and the top-buggy man. Don't buy a top-buggy and then have to get a white man's mule to draw it. I heard of a man, in South Carolina, who had $60 left from his cotton crop, after paying all debts, and he was persuaded to buy a top buggy

with it and, not having any mule or horse, he pulled in front and his son pushed behind to get the buggy home. We must stop this and come right down to business. Some go off on every excursion that comes along. The excursion is a curse to our people. If you have got a minister that encourages these things get rid of him. The railroads will treat us better when we do better by ourselves.

### POULTNEY BIGELOW AS CRITIC

POULTNEY BIGELOW, the American historian and traveler, on his return to London from delivering a course of lectures at Harvard and Yale said:

Commercialism runs riot in the United States. The yankees are coining their ideas and energy into money and the trust builders are doing the rest. These money kings must necessarily exercise a blighting influence on the morals of public servants. They create all manner of temptations and breed all manner of jobbery.

In Washington I found a cynical contempt for the Constitution. Corruption stalks through the government departgress. Congress itself is little more than a brokerage shop for the sale of authority to fleece the people. The legislators, department officials and petty public servants of all kinds neglect no opportunity of turning their official prerogatives to profit.

America needs a thorough arousing of the public conscience. It needs, to deliver it from the slavery of capitalism, such men and women as delivered it from the slavery of human beings. In other words, it needs an epidemic of cranks—cranks like William Lloyd Garrison—cranks such as England had in Richard Cobden and John Bright.

### THE IDEAL OF EDWARD EVERETT HALE

IN an address delivered by Edward Everett Hale in Washington recently, he urged a larger interpretation of the purposes of education. Lessons should be so arranged, said he, as to lead the pupils to look "outside the schoolroom into the town, outside the town into the state, outside the state into America, outside of America into the world, outside the world into Orion and Arcturus; to ask that question of questions, What is beyond the farthest star? and that other question, What was there before the beginning of things and what will there be when things are no more?

"Lessons in arithmetic, in algebra, in art, in history, in physics and metaphysics must be made to inspire our children with more abundant life, or books and blackboards and schedules and pens and paper shall go out of the window altogether and be burned in one great holocaust before the door." The drift of public schools is too much toward things and physical relations, said he. We want to give life to our symbols and methods, so as to instill truth, honor, faith, hope and love into the processes of our workaday world.

## RELIGION, PHILANTHROPY AND REFORM

### A PHILANTHROPIST IN THE SOUTH

N. O. NELSON, whose social experiments at Le Claire, near St. Louis, were fully described in Our Day of last year, has been making investigations of manufacturing conditions in the South. The firm of which he is president has an establishment at Bessemer, Ala. It is his purpose to establish a southern Le Claire. He writes to The Outlook that the negroes are everywhere not only deprived of political rights but plundered unmercifully. Nearly all large industries have a commissary attached, in which the prices are high, and advance payments are made in checks—good only at the store. Payments are made at the middle of each month for the preceding month's work, thus securing a larger use of store checks. These checks pass current in the market at eighty cents on a dollar. Besides this there is a poll tax of two dollars and a half, which every laboring man must pay; and, if he does not pay it on time, he is arrested and compelled to pay it, with three dollars costs, or work it out at fifty cents a day. Shacks of one room and a shed kitchen, costing altogether not more than fifty dollars, are rented to the negroes at four to five dollars per month. The great iron furnaces run the year through, Sundays as well as week days. Mr. Nelson says:

"At our works I am taking steps somewhat similar to those at Le Claire to humanize conditions. We pay weekly; we help the men out of their difficulties; supply ice water and coffee for dinner, and are going to have a commissary, at cost prices, for cash in hand; and we shall build some houses for such men as want them, to be paid for in easy installments, at cost, and 4 per cent. Yards and gardens are now hardly to be seen; I hope to get them started in our part of the town."

### UNIQUE CUSTOMS OF AMISH SECT

A TYPICAL Amish house of worship is divided into two sections, one for men and boys and the other for women and children. In the basement is a kitchen where the worshipers cook their Sunday meals during the recesses of the services which begin at 8 o'clock in the morning and last until 4 or 5 in the afternoon.

Bishops, preachers and elders of the church must take no pay. When the Lord's supper is served in church the feet of the participants must be literally washed. No one must be idle, man, woman or child. The church is supreme over all the acts of its members. Kissing of wives and fondling of children in public is frowned upon. Wall paper with figures on it is not allowed in the houses. Pictures are not permitted on the walls in houses. Carpets are forbidden. Only that which is plain and simple is tolerated.

The church arranges all marriages. The bride has her husband selected for her or the bridegroom his bride. The church in making these selections does it for the purpose of interbreeding the sexes and producing averages or raising tone. Thus the bright girl is married to the lazy man or the bright man given the most slovenly girl in the community. After the wedding, which takes place in church, bride and groom do not see each other for a week. Then they begin living together. No one can be admitted to the church without confessing all sins and making atonement for them as far as possible. No buttons can be worn on clothes. Only hooks and eyes are used. It is forbidden to sit for a photograph. One must not go to law. All propertyand money, although held by individual members of the community, are for community use. If one is without money and land all must help to secure him the same. Children must be obedient, kind, and gentle. Tale-bearing is forbidden.

### GLASGOW'S TEMPERANCE EXPERIMENT

GLASGOW, Scotland's greatest city, famous for its management of the tramways, handsome municipal buildings, excellent tenements, fine art galleries and other enterprises, is notable also for the temperance reform. R. A. Cochrane, editor of the Scottish Reformer, writing of this, says:

Ample proof of advanced temperance sentiment in Glasgow is to be found in the composition of the present council. Of its seventy-seven members forty-six are favorable to temperance reform and no fewer than thirty-two members are abstainers. No less evidential is the fact that ten of the sixteen Glasgow magistrates are teetotalers.

It was Glasgow which led the way in abolishing all public-houses in corporation property—an example which has since been followed by London, Edinburgh, and other cities. There had been licensed premises in Glasgow municipal property since 1866. The question of keeping down the number of public-houses was first raised in the council chamber about 1888. In that year six new licenses were granted in the lower court. Bailie (now Lord Provost) Chisholm called attention to the iniquity of increasing the number of licensed premises and the result was that the temperance party had the pleasure of seeing them refused by the confirmation court. Since that day till the present time no additional license has been granted. This action has, of course, given heart to the temperance party. Where there were leases existing—none of them were long—these were allowed to expire. The remainder were suppressed, some at once, some in one, two, or three years. 34 licenses have been wiped out, their total annual rental being £2,459.

It might be presumed that the suppression of these public-houses meant considerable loss to the corporation from the fact that a higher rent is demanded from a publican than from other tenants. The inference is more apparent than real. In many cases the old properties have been pulled down, and in their places have been erected new buildings from which is derived a higher rental. In the case of properties left standing it was generally found that after the disappearance of the public-house a better class of tenants could be obtained for the surrounding houses and shops. In this way many plague spots were removed.

# REGULATING THE CLOCKS OF A NATION

## CAREFUL SCIENTIFIC METHODS WHICH ARE APPLIED TO GIVE ACCURATE SERVICE

IT may not be generally known that the government sets the clocks of the nation. Every day at noon seventy thousand clocks are corrected and all other time pieces thus regulated.

This time service comes from the naval observatory in Washington, and its original design was to furnish mariners at seaboard cities with the means of regulating their chronometers. Like a great many other government institutions, it has strayed from its original purpose and now it serves another of more general usefulness.

It is ostensibly free; actually it is not free, but costs the owner of each clock $15 a year. The government furnishes the signal free, but the government does not deliver it. If you want to string a wire to the naval observatory from your office in New York, or Chicago, or San Francisco, the Navy Department will furnish you the signal every day without money and without price. But the stringing of wires is costly and attended with great difficulties. So you necessarily turn to the telegraph company, with its 350,000 miles of wire; and this company puts a wire into your office and connects it with its great system which has a wire running to the observatory. No one knows what the company receives from its time service, but reckoned on a basis of $15 a clock each year and 70,000 clocks, the amount should be more than a million dollars. This sum it receives for suspending all business on its wires from 11:57 to 12 o'clock, Washington time, each day, and giving the operator at the naval observatory full control of them. Actually the operator there does not send the signal—it is sent automatically by a remarkable clock—and so far as the time balls are concerned, the preliminary work is done by a man in charge of each, who hoists it to position and throws its machinery into the circuit before the final signal goes out. The telescope used in the business of measuring time is the transit instrument. Here, on each clear night, an observer watches the movement of the stars, and by their aid corrects the big Frodsham clock which stands in the signal room. In the making of the observations the web of the spider plays an important part. Threads of cobwebs are not only fine, but wonderfully strong for their fineness. They also possess a remarkable stability, not being affected by moisture and neither expanding nor contracting with changes in the temperature. These threads are used to make cross lines extending at right angles across the field of view so as to divide it into mathematical spaces. The Washington spider webs are obtained by expeditions sent out in June of each year. They collect from barns and fences the cocoons of big "turtle-back" spiders. Each cocoon is wound with a single filament, and this is reeled off and used to divide the telescope's field of view.

THE INTERNATIONAL STRONG MAN
If he isn't careful he'll break his back—*The Chicago Record-Herald.*

The Frodsham clock is set for sidereal time. Between this and standard eastern time there is a difference of 8 minutes, 12.09 seconds. The other clocks, when they are regulated by the Frodsham, must be made to vary just 8 minutes, 12.09 seconds from it. This is accomplished by an ingenious recording device. A cylinder standing on an adjacent table is made to revolve at a fixed rate of speed. A stationary pen loaded with red ink makes a straight mark on the paper, which is fastened around this cylinder. In each of the two clocks is a cogged wheel just behind the dial which turns with the second hand. Each of the cogs in turn touches a brass spring, which closes the circuit of a battery. An electric impulse from this battery passes through the pen and by a mechanical arrangement causes it to make a horizontal mark on the cylinder. Thus every second is permanently recorded. The Frodsham clock is also in circuit with this pen. A cup of mercury rests in the clock. It is connected with one pole of the battery. The pendulum is connected with the other. As the pendulum swings it touches the mercury in the cup, closing the circuit and sending an electric impulse through the pen. This impulse also causes the pen to be deflected and to leave a mark on the cylinder.

It is easy enough to set either of the other clocks within a second of the Frodsham—to set the minute hand at the eight-minute variation and the second hand twelve seconds more. But the fraction of the remaining second must be measured with great nicety. This is done by measuring the space between the marks on the cylinder with a prepared graduated scale which shows the difference between the two beats to hundredths of a second. The operator doing this accelerates or retards the clock to be regulated by touching the pendulum with his finger till the space measured shows that the fractional difference is just nine-hundredths of a second. Then the clock is ready for the day's work.

All this takes place not too long before the noon hour, so as to give the clock little time to lose or gain. There is a sounder on top of the clock which steadily ticks off the seconds loud enough to be heard in the adjoining room. At three and a quarter minutes before noon approximately the big clock is switched into the telegraph circuit.

This signal clock has a toothed wheel directly behind the wheel which marks the seconds. The wheel is divided into sixty spaces, but the tooth representing the twenty-ninth second is missing, and so are those representing the thirty-fifth, fifty-sixth, fifty-seventh, fifty-eighth and fifty-ninth seconds. As this wheel revolves the teeth come in contact with a spring which is in connection with the current, closing the circuit and causing the sounder to respond. The twenty-ninth signal drops out and that intermission indicates the approach of the half minute. In the same way, an intermission of five beats indicates the approach of the end of the minute. This arbitrary arrangement is designed to warn operators all over the country when they cut in at just what point they have come on the circuit. Before the final signal there will be a lapse of twenty seconds. This is brought about by the action of the operator at the observatory and is not automatic like the other intermissions. It is produced by the operator moving the switch key, which throws out of the circuit the wheel marking the seconds and throws into circuit the wheel that marks the minutes. If an operator comes in on the circuit and the first come in on the half minute; if the intermission is five seconds he knows he has come in just before the minute, but not the final minute. If he counts more than five seconds he knows that it is the final intermission before the noon hour and he acts accordingly.

What this operator and what all operators have to do in regulating the time ball is to turn a switch between the sounding of the fortieth second and the signal which marks the final minute. As soon as the operator has counted more than five seconds in the intermission he knows that the next signal

will make the exact hour of noon. The time ball has been hoisted to its position at the top of the pole.

These poles are in conspicuous places in every large city in the United States, usually on the top of the Western Union Telegraph building. The ball is of canvas over a globular form. There is a mechanical device by which a single impulse sent over the wire when the time ball is in circuit pulls the trigger and releases the ball so that it falls to the bottom of the pole. In the intermission which he knows precedes the final signal, the operator throws the switch, and in this way all the time balls in the country are brought into the circuit with the naval observatory.

In the last 100th of the last second of the fifty-ninth minute of the eleventh hour at Washington the tooth of the minute wheel touches the spring which closes the circuit and simultaneously the time balls all over the country drop. When I say simultaneously, of course, I make no allowance for the fraction of a second during which the electric impulse is going out from Washington. Such an impulse has been sent from Washington to San Francisco in one-fifth of a second.

The clock regulating is done by another piece of mechanism. The same signal which drops the time balls throws a lever in the thousands of clocks all over the country. This lever strikes a cam which governs the second, minute and hour hands, and with one motion the lever throws these hands to the perpendicular, making the clock mark the exact hour, minute and second of noon.

## RECENT EXPLORATIONS IN CHALDEA

IN the wonderful resurrection of the long-buried past, which has resulted from the explorations in Egypt and Chaldea, especially in the latter, no phase of life seems likely to remain untouched. Trade and commerce are represented by thousands of contract tablets, extending back to a period of more than thirty centuries before our era. Law may be studied from the contemporary records of all ages; and the new collection now on exhibition in the Babylonian room of the British Museum deals with a most important and interesting section of national life. Herodotus, Strabo, and other classical writers have testified to the immense fertility of the Mesopotamian valley, where cereals yielded a hundred-fold increase. It was, we know, the granary of the Persian empire; but it was little imagined that there would be rescued from ruins of a Chaldean city the complete records and statistics of a Board of Inland Revenue and Agriculture, which organized the affair of the state at as remote an age as B. C. 2400.

The Trustees of the British Museum have obtained a collection of several thousand tablets, in wonderful preservation, which related to the fiscal affairs of Southern Chaldea, under the rule of the Second Dynasty of Ur, and the perfectly organized system which they reveal is indeed astonishing. The tablets come from Sirpurra—the modern Tello, on the Shat-el-Hie—which seems to have been the center of local government. At the period to which those documents belong, Babylonia was covered by a vast network of main and irrigation canals, bordered by rich and fertile fields. The revenue to support the state and the temples was collected in kind, and necessitated an organized bureau of officials. This we know to have existed from far earlier times, and the inscription of Manishtisu, dating from at least B. C. 4000, which was found at Susa, and the contract tablets of Sargon I., B. C. 3800, now in the Imperial Museum at Constantinople, mention both "surveyors" and "tax collectors."

The first essential of a system of taxation was an accurate survey and valuation of the land, and this we see had been completed. The museum does not possess any of the surveys, but several carefully drawn, with dimensions of each plot of ground and the area given, have been found. The value of all land was calculated by the amount of corn required to sow it, at the market price of the wheat. There are exhibited a number of curious bun-shaped tablets, which are the official reports on the area and corn value of certain estates. The area is calculated by the gan or padannu, the modern feddan, or one acre six poles, while corn is measured by the ga (half bushel) or the gur, equivalent to the Hebrew Kor, or quarter (38 bushels.) From the inscription of Manishtisu, the oldest known commercial record, we have an illustration of this value of land by corn value. A field of 3,834 feddan has a corn value of 1,278 quarters; the money value is obtained by estimating the corn at one shekel a quarter, and the price of the land is therefore "three talents thirty-three mana."

The most interesting feature of the large account tablets dealing with the corn revenue here exhibited is the wonderful accuracy of the bookkeeping. The London Standard calls attention to the fact that some of the large tablets contain summations of hundreds of thousands of quarters, and calculations of minute fractions, yet the errors are very few indeed. The large account tablets are carefully dated and attested with the name of the collector. Thus we read: "The account and return of the Ur Lamassu of the temple of Ningirsu, overseer * * * From the month Airu to the month Nisan for thirteen months in the year, when Kharsi and Khumurti were spoiled." A word must be said as to the calendar in use; it was essentially a farmers' calendar, having the months named, "Month of corn-raising," "Corn-cutting," "The month when the fields are bright," "The month when the cattle are in the open." "The month of sowing."

Next to the tablets relating to the corn crop of the land, the most important, perhaps, are those recording the farm stock, the flocks, and herds. According to the law, all stock had to be presented for registration every year. In some cases the herds were brought to the local temple to be registered, in others the overseers visited them and made their report. There are many hundreds of these returns in the collection.

A word in this connection should also be said as to labor, for many of the tablets contain lists of men employed on the farms and estates. They were supplied with food and paid a small wage. Thus we read in a very old inscription: "These are the men to whom he shall give food and silver." To some of the workmen clothes—loin cloths—were supplied, and the lists of tools seem to show that they belonged to the masters. As to the trades mentioned in these and other tablets, we find millers, bakers, smiths, barbers, carpenters, as well as merchants, scribes, and surveyors. To the student of land laws and agriculture in India, Arabia, and Palestine, these records are, indeed, priceless. It should be added that the authorities have not been content with exhibiting these treasures, as all the best specimens have been carefully facsimiled by Mr. Leonard King, the senior assistant of the department, and thus rendered accessible to Assyrian students.

## LOFTIEST OF ALL RIVERS

THE Tsangpo is in several respects the most remarkable river in the world, according to a conservative writer in the National Geographic Magazine. It is the highest of all navigable streams, flowing for nearly a thousand miles at an elevation of from 11,000 feet to 14,000 feet. During the greater part of its course its current is sluggish, but for a hundred miles or more the mighty river, in its descent to the coast plain, runs with the speed of a mountain-torrent. Though one of the largest of Central Asian streams, it has never been followed from its source to its mouth, and until recently it was doubtful of which of two well-known rivers it was the head waters.

The Tsangpo rises in the extreme southwestern corner of Tibet, at a height of nearly 15,000 feet. Receiving the drainage of the slopes of the Himalayas and of a little known Tibetan range running parallel with these mountains, it soon becomes a stream wide and deep enough to be navigable. There is a considerable boat traffic upon it, at an elevation of little below the summit of Mount Blanc. It flows due east for some eight hundred miles, receiving numerous large tributaries from both south and north, and when near Lhasa it is, at low water, nearly a third of a mile wide and twenty feet deep; in flood two miles wide and of unknown depth. In longitude 94 degrees east it makes a sharp bend to the south, and passes through the Himalayas in a course known only to the savages who dwell upon its precipitous banks.

When last seen by an explorer it is at a height of from eight to eleven thousand feet, but when it emerges in Assam it is only four hundred feet above sea level. From this point it pursues its sluggish way for another eight hundred miles as the Brahmaputra to the Ganges and the Bay of Bengal. There has been a long controversy, into the details of which it is not necessary to enter, as to whether the Irawada or the Brahmaputra is the continuation of the Tsangpo. Though there has been as yet no direct evidence—the last expedient of throwing in marked logs in Tibet having failed—the general concensus of scientific opinion is in favor of the Brahmaputra, and the latest English gazeteer describes it under th's name.

# EDUCATIONAL PROBLEMS OF OUR DAY

## SELF-GOVERNMENT IN SCHOOLS

WHEN all other methods have been tried in vain, when the teacher has failed to govern the school room either by the rod of iron or the law of love, it sometimes happens that self-government is the only solution of the problem. Dr. A. E. Winship, writing on this subject in the Journal of Education, says that there are two distinct and widely applied systems of self-government in schools. One known as the "school city" owes its promulgation and probably its origination to Wilson L. Gill of New York City. It is claimed that more than 50,000 children are already living under this system, the root idea of which is a complete municipal school life, with city government, chief of police, police captains, sergeants and policemen. They make their own rules and see to their execution.

The most complete exemplification of the school city is in the normal and training schools of New Paltz, N. Y., under the leadership of Dr. Myron T. Scudder. From the littlest tots in the lowest grade up to the post graduates of the normal school, the government is absolutely that of the school city.

From the cleanliness in the aisles to the deportment in school and out, by day or evening, these officers have entire charge.

The other system is what is known as "pupil government" and originated with John T. Ray of Hyde Park, Ill. There are said to be 50,000 American school children, also, under this form of self-government all influenced by the spirit and under the direction of Mr. Ray's ideal. He says that no amount of subsequent teaching of the theory of democratic citizenship can undo the false ideas that are put in practice during the eight or twelve years of a child's school life. A child that is taught in school life that he has nothing to do with the good order or conduct of the school, and is taught that this is the teacher's business, will be very apt to have the same ideas of his duty as a citizen toward the general conduct of the members of the community—let the officers enforce the law.

The boy who unhesitatingly does wrong in school and relies with confidence upon his schoolmates not giving him away, because they might be called "tattlers," is ready to develop into the brazen boodler and law-breaker who does not hesitate to defy public opinion.

The Mosaic law, the English common law, and the statute laws all insist that a citizen shall be a witness when called upon, and that a knowledge of a crime deliberately concealed makes one a party to the crime. Yet in our schools we teach exactly the opposite.

The remedy is to enlist the pupil from the first day he enters school in taking an interest in the community life of the school. Let him feel that he can have a voice in making and enforcing all the regulations that affect him in his school life outside of mere intellectual work. The pupil who is disposed to do right should be urged to make his influence for right conduct as pronounced as does the evil-disposed or thoughtless pupil who imposes his wrong conduct on pupils and teachers alike.

As it is now, the teacher stands on one side for right action, on the other stands the active element of disorder, while as lookers-on—drones in influence—stand the majority of the pupils, who do right themselves, but are neutral in their influence in the school, as they will be in civic life afterward.

The purpose of the pupil government experiment being tried for the last five years in the John Crerar school of Chicago was to try to give practical effect to this theory of Mr. Ray. By means of officers called "tribunes"—protectors of the rights of the pupils—together with those who actively assist in securing good conduct, the government of the external affairs of the school is carried on. These pupils, who properly conduct themselves and use their personal influence for proper conduct in the school, are made citizens of the school, a badge of honor, of privilege, of responsibility. The tribunes and citizens wear a pin bearing a flag, the name of the school, and the inscription and motto, "Pupil government—of the pupils, by the pupils, and for the pupils." The five years' experiment has been an increasing success in the opinion of teachers, principal, pupils, and patrons.

## CHILDREN CULTIVATE FLOWERS

THE Goodrich Social Settlement of Cleveland has taken especial interest in the culture of flowers. Commenting on this The Outlook says that a year ago these workers conceived the capital idea of extending their endeavor and reaching, through the public-school children, all the crowded neighborhoods of the city. They sent a circular to the school-teachers, and the appeal met with immediate approval and co-operation.

The plan adopted was to supply penny packages of easily grown flowering annuals, to be sold to such pupils as wished to purchase them. A choice of nine varieties of flowers was given—nasturtiums, four-o'clocks, morning glories, coreopsis, larkspurs, zinnias, marigolds, bachelor's-buttons, and calendulas.

When the returns came, it was found that nearly fifty thousand packages had been bought. The teachers gave short talks upon the preparation of soil, the effects of sunshine and shade upon plants, and the proper times for watering. These talks both preceded and were con-current with the planting of the seeds. On each package also some suggestions to the child were printed. The sale of the penny packages covered the cost of the seeds, envelopes, putting them up, printing, and all expenses.

Enthusiasm was manifested in many ways, and the consequent flower shows held in several buildings throughout the city gave evidence that at least three-quarters of the plantings were successful. The greatest good accomplished was in the efforts of children to make others happy with the flowers.

Last year's success was so great that a further extension of this exemplary work is planned for the present year, increasing its sociological importance to the entire community.

## THE SALARIES OF TEACHERS

THE question of salaries for public school teachers will perhaps never be settled as it should be, yet there is no doubt that it is receiving more careful study. In Syracuse, N. Y., a comparison has been made between the teachers' salaries and those for other city employes. It is stated that 560 teachers receive $352,790, an average of $630, while 588 other city employes receive $571,999, an average of $973. When it is remembered that the 588 includes some genuinely unskilled and untrained help, elevator boys and ash barrel emptiers, the comparison is startling. Fifty per cent. higher prices are paid for not being in the educational department. There are seventy-eight persons below the mayor, comptroller, president of the city council, etc., who draw $132,630, an average of $1,700, and scarcely one of these positions requires more education, native ability, preparation, experience, or character than to be a good grade teacher, and less than to teach in the high school. The city pays nearly three times as much to a man who sits in a "revolving chair" as to a teacher who has the future of fifty boys and girls in her keeping.

## AT HAMPTON INSTITUTE

HAMPTON INSTITUTE has just celebrated its thirty-third anniversary of successful work for the black race. A number of visitors from the north who were present will always remember with pleasure the Whittier school, with its 400 black pickaninnies, who stand in long rows in the great bare hall and sing, as no other children can sing, their weird plantation songs. Then, with upraised hands, they take the oath of allegiance to the flag of their country. The picture of the tiny kindergartners, whose heads barely reach the platform, following the motions of their elders in this exercise, stays somehow in the memory. There were school gardens, with celery, lettuce, radishes and peas already above ground. From these the visitors proceeded through the orchards and experiment garden to the domestic science building of the institute. Here girls in white aprons were taking lessons in dairying or in cooking, others were weaving on a primitive loom the intricate patterns of the blue and white counterpanes of our grandmothers now become so fashionable as portieres and table cloths. Classes in basketry and lace making aroused great interest, and the agricultural class rooms were constantly crowded.

How much actual teaching shall a principal do is being discussed, more or less, in all large cities. In Chicago eighty principals teach twenty-five minutes a day; thirty-five teach from one-tenth to one-fifth the time in school; twenty-five teach an hour a day; forty do not teach.

## The Danger is in the Neglect!

That persistent, tickling cough, if not cured now may hang on all winter and lead to lung troubles. It's what a cough may lead to that makes it dangerous. Be armed against danger by keeping always in the house, ready for use,

# HALE'S

## Honey of Horehound and Tar

Containing the soothing honey, the strengthening horehound and the antiseptic tar, it is a speedy cure for the most obstinate cough. It will not derange the weakest stomach and is a standard remedy for affections of the throat, recommended and prescribed by leading physicians. Of all Druggists. Refuse substitutes. Be sure and get

## Hale's Honey of Horehound and Tar

***Pike's Toothache Drops Cure in One Minute.***


## THE QUAINT, CURIOUS AND SINGULAR

### UNCLE SAM AS EDITOR

ONE of the most unique conditions in the history of bankruptcy proceedings is presented when it is known that the United States government has been conducting a newspaper. More than that it has been an anti-administration newspaper and Uncle Sam has made money enough out of it to pay the claims of creditors in full, restore to the stockholders of the bank the assessment of 100 per cent. which was imposed by the receiver, and they will probably be able to realize something on their stock.

William M. Singerly was one of the big men of Philadelphia, and among other interests owned the Daily Record and controlled the Chestnut Street bank. He was also engaged in the manufacturing business; had a fancy stock farm and was connected with many other enterprises. Three months before Comptroller Dawes came into office Mr. Singerly failed for about $7,000,000, and his only valuable asset was in his newspaper. The bank went down in the crash, and all the other institutions with which he had been associated. So many people were involved in his public and private enterprises that a committee of citizens was selected to adjust his affairs and take care of his property without the intervention of a receiver. To complicate matters the more, Mr. Singerly died. His mind gave way under the burden of his troubles, and he is believed to have taken his own life.

The government, represented by the comptroller of the currency, being responsible for the interests of the creditors of the bank, refused to consent to the arrangement made by the citizens' committee, because under their plan the stockholders of the bank would be relieved from individual liability and its available assets would be used to satisfy claims against other property. The mayor and other prominent people remonstrated and appealed to the president, but the latter would not interfere with the comptroller. George H. Earle was appointed receiver, and to his energy and ability Comptroller Dawes generously ascribes all credit for the management of the affairs.

At the same time the comptroller took charge of the newspaper, and has been conducting it ever since. He has not interfered with its editorial policy, and it has continued consistently to criticise the President and the policy of the administration, with such success that during the last three years it has made the largest profits in its history.

### TO DEVELOP A RACE OF GIANTS

ALMOST extraordinary will has been left by the Count Alexander Louis St. Ouen de Pierrecourt, who has just died at Courbevoie. He leaves 8,000,000 francs to his native City of Rouen, with the following restrictions: Sixty thousand francs annuity is to be paid during life to his two old servants; 50,000 francs a year to the two healthiest children in Rouen; and 100,000 francs is to be paid yearly to the healthiest pair of young giants who shall marry and have children. This legacy, the Count declares in his testament, he leaves with the intention to regenerate the human race and increase the size of men. The will specifies that candidates for the prize must undergo a medical examination and be perfect specimens of the human race, and in order that such sudden fortune may not turn some young giant's head the Count provides that the legacy shall be divided equally between the contracting pair.

The Count explains that the amelioration of the human race is a necessary work.

### A TONGUE OF ALUMINUM

IT is stated by a well-known surgeon of New York City that a French savant has perfected an artificial tongue of aluminum which is almost as useful as the original member. This information was brought out in connection with the operation which deprived Willam H. Crampton, the "preaching policeman" of his tongue.

It is believed that the nerves will gain control of the muscles in the stump just as they formerly controlled the tip of the tongue, which is now gone, and that the lecturer will again be able to articulate clearly. There will be a slight oddity about his speech, the surgeons say, but it will be clear and intelligible. He may not need the artificial tongue.

### A BLIND DOCTOR

A NEWS item states that George S. Dobbins, who has been blind for eighteen years, has been given a degree by the Chicago Homeopathic Medical College. To secure his degree Dr. Dobbins took the four-year course in medicine, supplying his lack of sight with a wonderful memory.

# WITH MEDICAL EXPERTS OF OUR DAY

## THE PHILOSOPHY OF INEBIATION

A PAPER just published by Sir Lauder Brunton and Dr. Zunnicliffe upon "Certain apparently injurious constituents of potable spirits" goes a long way towards explaining the reason for the various physiological symptoms arising from over indulgence in alcoholic liquors, particularly whiskey. Their researches show that while intoxication is undoubtedly caused by the ethyl alcohol in the liquor, the actual way in which inebriates get drunk, or get sober after being drunk, depends on the quality of the liquor partaken of, and that this quality is positively determined by the amount of an organic impurity called "furfural" which the whiskey contains. The source of furfural in the manufacture of whiskey is a class of substances known as pentosans; these are derived from the cellulose of the grain husks, and under the influence of heat, in the presence of acids, are in the wash still converted into furfural. This furfural in the body tends to pass into its corresponding acid, thus diminishing the alkalinity of the blood, which, according to most physicians, favors the occurrence of gouty deposits in the joints. The physiological action of pure furfural on animals and man was studied and led to interesting results. It gives rise, it appears, to paralysis of the voluntary muscles, and to clonic and tonic convulsions. The odd point, however, about these symptoms is their transient nature; immediately after the injection of the drug, the animal would fall completely paralyzed, convulsions would ensue, and the animal would then become rapidly normal. Two human subjects who were brave enough to take this active poison in the same dose suffered from throbbing headaches which lasted for a day. This result leads to the most interesting point of the research. It will probably be generally admitted that the commonest results of too free potations on the human subject is a bad, throbbing headache, and this headache appears to be directly caused by the furfural impurity in the liquor.

The reason that old whiskey is less liable to cause headache than new is that maturation diminishes the amount of furfural which it contains. This effect of maturation can also be obtained by distilling the fresh spirit with phenyl-hydrazine-sulphonate. By this means the authors were able to obtain a furfural-free whiskey, and to watch the effect of it upon animals, comparing it with that of the same spirit before distillation. They found that in the case of the original spirit the animal in the transition stage from drunkenness to sobriety was restless, uncomfortable, irritable, and for some time after refused food. In the case of the furfural-free spirit, these secondary symptoms of drunkenness were entirely absent, and on becoming sober the animal appeared perfectly normal and took food with relish. Curiously, all "pick-me-ups," such as citrate of caffeine, are just such substances as neutralize furfural.

## BREAKING UP A COLD

FREDERICK M. ROSSITER, M. D., writing of the best preventives of colds and how to break them up calls attention to the morning bath as one of the best and most effective tonics which is available to all. But when the cold is already started the first thing is to break it up. Concerning this he says:

When we speak of "breaking up a cold" we mean, physiologically, that the circulatory equilibrium of the blood must be re-established. But a cold can not be "broken up" after twenty-four or thirty-six hours. It then runs a definite course, but may be mitigated in its results by proper treatment.

The various measures that may be employed in the beginning of a cold to re-establish the disturbed circulation are the following, which may be adapted to the needs and surroundings of the patient: a. Go to bed and remain there twenty-four hours; this is simple, but effectual. b. Take vigorous exercise, as a long walk, a bicycle ride, a run, or stand in the fresh air and take one hundred deep inspirations, rising on tiptoe each time. All these forms of exercise should be followed by a cold shower bath or a cold sponge with vigorous friction. c. If taken in time, a cold may be broken up by the copious drinking of either hot or cold water. Several glasses should be taken in succession. This treatment is re-enforced by going to bed. d. A very effectual way of dealing with a cold is to take a hot foot bath, apply fomentations to the spine, and a cold compress to the head and neck, continuing the treatment until free perspiration is induced. One must then be wrapped in a sheet and put to bed. This treatment may be made more thorough by preceding it with a thorough hot enema. e. The hot and cold spray with considerable pressure is also an excellent treatment. The cold wet-sheet pack continued to the point of perspiration or the hot blanket pack are favorite measures for combating an inflammation of the mucuous membrane.

Local.—If the cold is in the head, the congestion may be relieved by applying cold compresses to the neck fifteen or twenty minutes at a time with a cold compress on the head at the same time, or an ice-bag at the base of the brain. Dashes of cold water in the face give some relief.

If the cold is in the throat, the cold compress just referred to may be employed, alternating with fomentations once in two hours. A cold compress of cheese cloth covered with flannel should be put on at night.

For a cold on the lungs or for bronchitis the chest pack should be employed.

Local applications in the form of sprays and inhalations are useful adjuncts in the treatment of colds. Menthol, camphor, and eucalyptus are three excellent preparations, and all can be administered in the form of sprays, by inhalers, vaporizers, and nebulizers. Vaporizers and inhalers can be conveniently carried in the pocket, and used with little trouble.

In order to make menthol or camphor effectual in the treatment of colds, it should be used quite constantly for from ten to twenty minutes, and the treatment repeated at least once in two hours.

## SALT SOLUTION REVIVES THE DEAD

THE use of a teaspoonful of salt in a pint of water which was injected into a vein in the arm of Mrs. Sallie Allen in a hospital at Evansville, Ind., is considered the cause of bringing her back to life. An operation for an abdominal trouble had just been performed and when it was finished three physicians examined the woman's pulse and pronounced her dead. Her respiratory glands failed to perform their functions. Nitro-glycerin, strychnine and other stimulants used to revive the heart's action were brought into use, but they failed to revive the patient.

Speaking of her remarkable restoration, Dr. Richstein said: Mrs. Allen went on the table in the best of spirits and we were all surprised when she unexpectedly collapsed. Everything known to medical science was done to revive her, and we had entirely given up hopes of bringing her back to life when it was decided to inject normal salt solution into her veins. The injection was made after she had been apparently dead for at least three minutes and we were rewarded almost immediately by seeing her open her eyes. The first thing she did after coming back to life was to ask for something to eat, and she is now resting well, with every indication pointing to a speedy recovery. I am satisfied the woman's heart did not pulsate for at least three minutes, and every movement of the respiratory system stopped before the injection of the normal salt solution was made.

## EXPERT STUDY OF SUICIDE

IN a paper printed in The American Journal of Insanity Mr. G. Styles presents statistics regarding the occurrence of suicides. Forty years ago it was shown that only 4 out of 10,000 persons rated as paupers died by their own hands, while 7 coachmen or other servants, 5 bankers or professional men, nearly 8 soldiers, 7 tailors, shoemakers or bakers, and only 1 3-10 carpenters, butchers and masons out of 10,000 were suicides. Sweden had the lowest average of all the countries considered, namely, 1 suicide to 92,000 persons; Russia had 1 to 35,000; the United States 1 to 15,000; Saxony 1 to 8,446. In St. Petersburg and in London the proportion was 1 to 21,000. If we take the statistics of the fifty years just passed for France the following results: For every 100,000 inhabitants of France there were in 1841-45, nine suicides; in 1846-50, ten; in 1861-70, thirteen; in 1871-75, fifteen; in 1876-80, seventeen; in 1889 alone, twenty-one; in 1893, twenty-two; in 1894, twenty-six. During the years 1826-1890 the percentage of suicides increased in Belgium 72 per cent.; in Prussia, 411 per cent.; in Austria, 238 per cent.; in France, 318 per cent.; in Saxony, 212 per cent.; in Sweden, 72 per cent.; in Denmark, 35 per cent.

# The Health Boards

have done the cities grand service by their efforts to secure cleanliness, but the dust of the streets is still laden with disease germs which collect on our clothing and would be absorbed by the skin if it were not for the daily bath. The simple use of pure water is not enough to rid the skin of these impurities. Sulphur destroys disease germs, and as combined in

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---

Pike's Toothache Drops Cure in One Minute.


## PROGRESS IN DISCOVERY, SCIENCE AND INVENTION

### A MODERN PIED PIPER

THE destruction of rats, which gave to the world the fabulous tale of the pied piper, is now being accomplished in a noiseless manner. The modern pied piper is the inventor of a virus which kills off whole colonies of rats without proving dangerous to men or animals. This virus was discovered by the Pasteur Institute of Paris. It has been tested officially in France, and has been used with success in other parts of the world. One of the most convincing tests in this country was made in the United States Marine Hospital in San Francisco. The results of this test were indorsed by Dr. Kinyoun, chief of the Marine Hospital service at Washington.

In its application the virus is mixed with food which is particularly pleasing to the rat palate. The food is then scattered about the haunts of the rats, and those which partake become infected with a disease which is fatal. The cannibalistic tendencies of rats leads them to destroy their dead comrades, and this results in further increase of the death rate. The disease rapidly spreads, and retains its virulence through several generations. Ultimately it loses its fatality, but not before the rats desert the locality in which the virus was scattered.

Science demonstrated in Australia that it could suppress the rabbit pest. It has also supplied the farmers of the Western States with a virus that has saved their crops from the gophers and ground squirrels. The virus that is fatal only to rats and mice was discovered not more than two years ago, but it already has demonstrated that these noxious pests can be destroyed.

### EDISON'S NEW DISCOVERY

THOMAS A. EDISON, the wizard of Menlo Park, has been successful in discovering a plan to separate hematite from magnetite and for converting the Norwegian hematite into high grade Bessemer iron. This has been described as follows:

Briefly, Mr. Edison's discovery amounts to a plan of separating the hematite from the joint deposits of hematite and magnetite. For many years the best mining engineers have regarded such a concentration as impossible.

The Dunderland mines in Norway are perhaps the most extensive ore deposits in the world. They have, however, been almost worthless because their double substance yielded less than 40 per cent. of metallic iron. By taking two tons Mr. Edison has found a way of extracting one ton of pure specular hematite running from 65 to 70 per cent. of metallic iron.

It is estimated that the Spanish mines from which the bulk of the British supply is now being derived, will give out in seven years' time. The Norwegian mines, on the other hand, are good for 200 years to come. With such wealth of raw material close at hand Englishmen figure that they will be in a position to meet American competition on somewhat even terms.

### AUTOMATIC LETTER BOXES

A NEW letter box invented by a San Francisco man is now being introduced in different cities. By a device attached to the front of the box the mail carrier, in opening and closing it, registers the time of the next collection. Above the usual card showing the collections for the day is a strip of glass, beneath the words, "Next Collection." When the carrier removes the mail the figures and words showing the time of the next collection, and also the time the collection will be due at the postoffice, appear. The public will be able to tell at a glance when the mail will be taken up again, and by reference to the usual schedule card can also ascertain when the carrier last made his rounds. There are 750 of these boxes in use in San Francisco and Chicago has recently placed the first hundred into position.

### SEEK MISSING LINK OF PLANTS

PROFESSOR JOHN M. COULTER, head of the botanical department of Chicago University, announces that botanical experts will leave the United States June 15 for Margarita Island, off the coast of Venezuela, in search of the missing link of the vegetable world. In tracing the evolution of plant life scientists both at Chicago and Harvard found a gap which could be explained only by the existence of a plant as yet undiscovered. Circumstances pointed to the probability of finding such a plant on Margarita Island, which never has been explored by scientific men.

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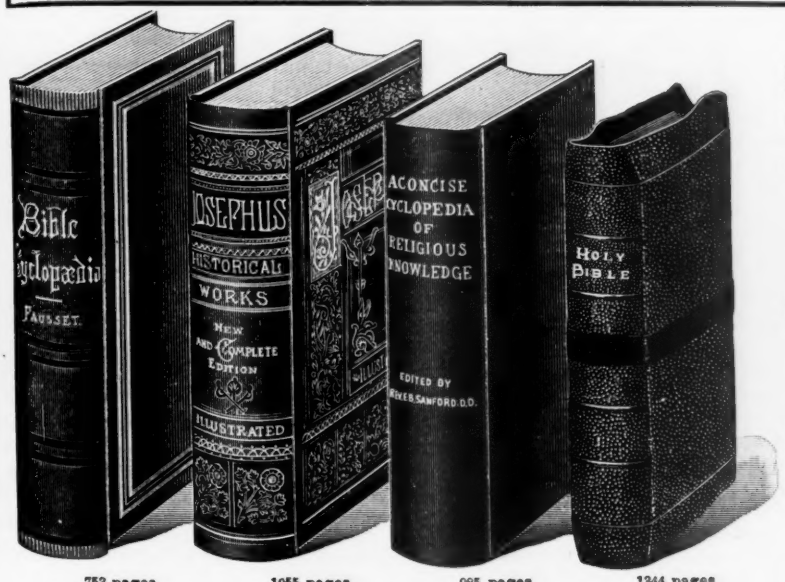


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# WHAT BOYS AND GIRLS LIKE TO READ

## HELPFUL HINTS TO BOOK-BUYERS FROM AN OLD LIBRARIAN OF NEW YORK CITY

THE city librarian who has an opportunity to study all kinds of people and all kinds of literary tastes was talking to a representative of the New York Sun recently on the subject of what boys and girls like to read now-a-days, and incidentally he made some remarks which would be of great value to parents and others in choosing the most interesting books for the young people. The librarian said:

I envy the librarian who has charge of a children's department, or whose library is small enough to admit of friendliness and respect between librarian and child. There's a beautifully direct quality about youthful literary opinion, particularly when the critic is a small boy. Girls are a trifle hopeless from a bookman's viewpoint. I like girls, but the undeveloped feminine intelligence is about as vertebrate as a jellyfish.

Girls, as a class, haven't any breadth and grasp in literary taste. They don't want to know about things. They want to know about little girls, and incidentally about little boys. As they get older they like to read about older girls and boys. That's their development. Now the boys want books about things. Of course, they usually want a boy in the book. That puts them in touch, but they want to know what he does rather than what he feels. They like hunting and adventure and fighting of all kinds, physical or moral, just so long as the fight is a good one. They can find history and biography absorbing if the books are full of force and dramatic actions.

I've had a long experience, and in the course of it I've found just four girls who liked boys' books, books of action and adventure, better than stories of sentiment and of things within a girl's personal sphere. We have no worthy successor to Louisa Alcott. She wrote for girls and appealed to girlish taste, but she wrote books that were in the main wholesome and sane and bright and forcible. When she did bow to the girls' demand for sentiment and love-making she didn't become maudlin.

It is easier to write a good story for boys than to write one for girls, and, in addition to the modern books, there are a good many of the standards that appeal to boys. There's a theory that the modern child will not read Scott, but I find that 'Ivanhoe' and 'The Talisman' at least, keep their place in the boys' heart. They are always out and are worn so rapidly that we have to replace them frequently. Boys like biography if it's the right sort, if the boy isn't too preternaturally good and if he did brave things and finally succeeded. I've been interested in seeing what American was most popular with young America. Daniel Boone wins in a walk. It is easy to see why. He was a fine sturdy hero and there were the Indians. Any man who fights well commands boy respect. If he does his fighting against Indians, so much the better. The red men ought to be held in grateful remembrance if for nothing else than for the joy he has afforded the small boy.

Adventure and travels take with the boys if they aren't too instructive. One boy whom I know very well is my critical tribunal for boys' books. He is a wholesome, clean, intelligent fellow of 14—boy all the way through, not precocious, not particularly good, not particularly bad, just plain, sensible boy. He reads books for me, and I find that his verdicts are sound, and that the taste of other boys almost always backs them.

My young judge was talking to me about the writers of boys' books the other day:

"I'd like to meet some of those fellows and give them a few tips," he said. "That's all some of them need. Now, there's Kirk Munroe; he's one of the very best of them and he's just as silly as any of them about some things. He just will tell you a lot of things you don't want to know. We boys want to hear about what people do, not what they know.

"Now what's the use of stopping a story right in its most exciting part, to tell all about botany and geology and truck like that? You start out to follow the Indians that have carried away a child, and the fool writer holds you up on the bank of the river, while he cuts down a tree and makes a canoe, and then he tells you about the tree it was made from, and all about the tree's family and relations, and what you could make out of it besides canoes, and about the shape of the leaves and the size of the branches and the kind of climate that's best for such trees—and all the while those Indians are paddling off like fury with that baby.

"It's enough to make you mad. Kirk Munroe ought to know better than that. He just writes a corking story and then he chops it up and puts chapters out of the school books in between the parts. Of course we always skip them, but it's kind of hard learning just how to skip and not miss anything. When people read aloud to you it's an awful nuisance. I've only got one person at home that knows how to read my books to me just the way I'd read them. That's my uncle. He's a peach at skipping. But I say it ain't fair to spoil stories and make a fellow work so hard skipping. They all do it, though."

Now, I believe that boy is right. I'd feel the same way he does about it. Somebody ought to reason with the writers. It's bad enough for us grown-ups to have to swallow politics and religious controversy, and social problems with our fiction. The boys might have their stories without encyclopaedia ballast.

One of the most noticeable library symptoms is the tremendous increase of interest in spiritual and theological problems. It is astonishing to see how many men and women are reading eagerly everything dealing with questions of life and immortality. We have a great many elderly readers who are absorbed in such literature. Psychology and all forms of occultism have a grip upon the public interest now, and sociological works find twenty times the number of readers they had even ten years ago. It interests me to see how many young men are delving in sociology and economics, a large proportion of them being from the working classes.

Then, every year we have more and more workmen who want books that give the best information on the subjects of their trades. Often the man will bring a list of books that has been given him by his foreman or employer. More often he comes and asks for the best authorities upon his line of work. That phase of the public's use of libraries strikes me as distinctly encouraging. It must be an increase of intelligent work.

## NOVEL INSTRUMENT TO STITCH WOUNDS

A NOVEL and most useful instrument has been invented by Dr. Paul Michel, a well-known French physician. With it wounds on a body can be stitched effectively, quickly and without causing any pain to the patient. Heretofore wounds were stitched by hand, and this operation was not only somewhat dangerous and slow but also decidedly painful.

The new instrument consists of a forceps or pincers and of a case or sheath, which contains a number of nickel hooks or bands somewhat similar to those which are frequently seen on the corners of cardboard boxes. A slight pressure suffices to free these hooks from the sheath, and within one minute between twenty and thirty of them can be placed on a wound in such a manner that they will effectively close it. The reason why they cause no pain is because their tiny rounded points only penetrate the epidermis and not the lower layer of skin. Other advantages which they possess are that they can be easily disinfected, that it is no trouble to remove them from the skin after the wound is healed and that they leave hardly any trace of a scar.

Dr. Michel has received congratulations from the most distinguished European physicians, and his instrument is being rapidly introduced into leading hospitals.

## QUALITY OF GOAT'S MILK

ACCORDING to the Paris Journal of Medicine, goat's milk has the advantage over cow's milk of being free from tubercle bacilli, and can be taken quite fresh. Contrary to general opinion the taste is not disagreeable if the animals are properly selected and properly kept, being considered of a more delicate flavor than cow's milk. The quantity of fats, caseine and salt varies greatly in the different varieties of goat. For infants and dyspeptics, the weaker milk may be chosen, while the stronger answers better for debilitated subjects.

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Your methods of teaching are to be highly commended. I predict for your school a revolution in the study of music, and a reversal of current empirical methods. CARL BUNGE,
*Director Metropolitan Orchestra.*

DALLAS, TEXAS.

I have been a student of music for the past twenty years, and must say that my six months' lessons have opened my eyes to music more than my previous nineteen or twenty years. JAMES WILKINSON.
*Mr. Wilkinson is one of the leading organists of the South.*

DONALDSON, GA.

I duly received your appreciated favor of May 18th, and have carefully read and re read the lessons sent me. After twenty years' experience as a teacher of vocal music, I feel free to say that your lessons are certainly in advance of anything I have ever seen.
D. L. BLEDSOE.

SYRACUSE, N. Y.

I like your plan.
(Prof.) HAMLIN C. COGSWELL,
*Director of Music.*

HALLECK, MINN.

The principles enumerated in your teachings have proven of constant application in my work and in my study of music. (Rev.) P. B. PEABODY,
*Rector St. John's Church.*

MOUND CITY, KANSAS

I have been a student of music for the past eighteen years; I have been a popular teacher and player for the past fourteen years; I was graduated from a good conservatory at Kansas City twelve years ago, but I have never yet read or heard anything that has so impressed me as your prospectus. I have found that which I have always wanted—a concise, scientific exposition of the *laws* governing music. I am a student, a thinker, and can read between the lines, hence the enthusiasm expressed.
MARY A. REESE.

CHICAGO, June 18, 1900.

MISS J. L. MANGAN, Ocean Grove, N. J.

Dear Madam:—If you wish to study music and cannot attend a conservatory, I should advise you to take the course offered you by the Chicago Correspondence School of Music. I do not know that there is any advantage in attending a conservatory. It is, after all, your personal work that is of value to you. I am familiar with the school and its methods, and know Dr. Marcus L. Quinn, the director, personally.

If you cannot afford to come to this city, and spend a year or two receiving instruction from masters, I should advise you to take up their course, because I know what it is. It is better to learn correctly what you do learn, than so much that you have to unlearn. Very truly yours. TH. BERESINA.
*Mr. Beresina was born in Austria, studied in Vienna under the masters, Joseph Hellmesberger and S. E. Grun. He afterwards became concertmeister in the Stadttheater at Bruenn; later solo violinist on a concert tour through Russia, the success of which resulted in his receiving a call to London as solo violinist to the Prince of Wales Club Orchestra.*

CHICAGO, ILL.

The value of your system is that your principles never need exceptions. I consider the work you offer the best in existence, or (believing that truth is single), I am convinced that your method is really the first scientific expose of music that has appeared.
EDWIN S. METCALF, Mus. Doc.,
*Late Director of Salem Conservatory, and late of New England Conservatory.*

TENALLY, N. J.

Believe it to be the very best method of study I have ever read or know of in the Musical world. I know whereof I write. ERNEST WOODWORTH.

869 THE ROOKERY, CHICAGO, ILL.

I thoroughly enjoy the study, although it is hard work, and can see that your method of asking questions is superior to telling a student all about it, and having him superficially glance over the instruction.
WM. N. HOLMES.

BERNARDSTON, MASS.

I realize that through the few lessons I have taken from you I have gained much knowledge of music. In fact, I feel that I know more about music since I have taken these lessons from you in this composition course, together with the piano course, than I have gained in all the lessons I have taken in the past.
MRS. ARTHUR FIELD WELLS.

DUNCAN, ILL.

To say I was highly pleased with your lessons, would hardly give expression to my appreciation. Your method is so easy and natural, yet withal, so comprehensive. E. J. SCHOMP.

ROCK HILL, S. C.

I find it impossible to practice all the exercises. I study them over carefully and considerably. They are to me of great value in doctrine and assistance in every day teaching, and infinite in suggestion.

The practice of the exercises as laid down in this course would discipline sufficiently any thumb, no matter how obdurate. W. B. STRONG.

1323 FRANKLIN AVE., NEW YORK.

Your method is a very thorough one from the base up, and I should think it would usurp the place of all others. MRS. S. S. RANDALL.

117 CHAPEL ST., NEW HAVEN, CONN.

I shall recommend your system whenever I can. I think it is the best I have ever heard of.
MISS R. BEMIES.

LOGAN, OHIO.

I am very much pleased with the first lesson, and have learned more from it than from all the harmony books put together. JOHN BOWEN.

GRANT, WIS.

I am very much pleased with your method of teaching. I am taking more courage in music.
MARTHA VAN WOERT.

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## SOCIOLOGY, LABOR AND COMMERCE

### DENMARK'S ODD MONOPOLY

THE English method of throwing its colonies open to the trade of the world is not patterned after by Denmark in its relation to Greenland. Trade always has been and still is monopolized by the state, and only government vessels are allowed to sail in Greenland waters. For foreign travelers, also, Greenland is a closed country, unless the traveler in question has beforehand secured the rare distinction of obtaining the permission of the Danish government. The monopoly of the trade is said to protect the Greenlander from being deceived by unscrupulous merchants. The administration settles a fixed price both for the goods the Greenlanders purchase and for the products they sell. In this way all are treated in the same manner, and the business being carried on by the state is a guarantee that the natives are not imposed upon.

The native Greenlander never has been, neither is he now, able to purchase a single drop of spirits from the administration. The exchange of goods between Greenland and Denmark is as a rule carried on exclusively by means of the nine vessels belonging to the Greenland company, namely, five brigs, three barks, and a small steamer, having a total register of about 2,000 tons net. Several of these vessels, which are suitable for sailing through drift ice, make two voyages a year, and the steamer as a rule three voyages. One of them, the brig, named the Whale, is nearly 100 years old.

*

### NO PLOUGHS WANTED IN CHINA

CONSUL-GENERAL WILDMAN, shortly before he sailed for Hong Kong on the ill-fated journey which cost the lives of himself and his family at the entrance to San Francisco harbor, wrote of Chinese agriculture and why American farm machinery is not in demand. He said:

If ploughs are used at all they are of home manufacture and of the most primitive character. The peasantry live at the rate of from two to five cents a day and even if they could afford to buy American machinery they would have no room for it on their little farms. If an entire village should combine to buy an American threshing machine it would be used but once for it damages the straw, wastes some of the grain and from a Chinese point of view costs too much to run.

*

### TRUSTS MAKE NEW JERSEY RICH

THE recent growth of vast industrial combinations has proved of great pecuniary benefit to New Jersey, where so many of the big trusts have filed certificates of incorporation. The fees that have flowed into the coffers of the State have lifted New Jersey from a struggling financial condition to a position which enables her to boast that she carries more ready cash than any other state in proportion to her population and area.

Before the stream of corporation fees began to flow into its treasury, New Jersey's state buildings were few and in poor condition, but during the last five years the state has expended about $4,000,000 on these structures.

It cost last year to run all the departments of the state $2,871,776. More than this amount came from the corporations. The income this year from registration fees will be at least $500,000 and from the franchise tax $1,600,000. The railroad tax will amount to $915,000. The tax on two life insurance companies is $210,000. So that in New Jersey the people are satisfied to stand sponsors for the "trust factory," because it pays the bills.

*

### RURAL INDUSTRIES of AUSTRALIA

IT is not very long since rural life in Australia almost invariably meant sheep-farming, the possession of thousands of acres, and a man's nearest neighbor probably half a day's ride away. But, although sheep-farming continues to be the most important of Australian rural industries, others have now been established on a large and stable basis. Besides providing for its own consumption—which is exceptionally large per head of population—Australia now exports a quantity of wheat, small in comparison with the world's production, but large enough to give it the sixth place among the wheat-exporting countries, and steadily increasing. The practicability of producing wine to compete with that of Europe has been conclusively demonstrated, and in Victoria and South Australia the production has been rapidly increasing. Tasmania has created a most profitable fruit trade with England, and in the other states the area devoted to orchards is steadily enlarging. Horse-breeding and dairy production have definitely passed the tentative stage, and have clearly a great future before them.

One writer on Australia, Frederick Dolman, says that the sugar beet industry is gaining a foothold in Queensland and in Victoria. The Commonwealth has the power, with the consent of the states affected, of taking over the railways, and if this power is exercised an extensive development of the means of communication may be expected.

*

### PROPORTION OF STEEL AND IRON

TABLES and diagrams have recently been published showing graphically the increased production of iron and steel by the different countries of the world. According to these tables, the production of pig-iron has increased from 825,000 tons in 1800 to 39,410,000 tons in 1899. It appears that nearly 70 per cent. of the world's pig-iron production is now made into steel. Yet Bessemer's first patent was granted so short a time ago as 1856, and in the same year Siemens Brothers obtained their first patent for the regenerative gas-furnace in the open-hearth process of steel manufacture. The relative proportions of iron and steel made in different countries vary greatly. France produces twice as much steel as iron, Germany makes five times as much, and America transcends every other country in the percentage of pig-iron turned into steel.

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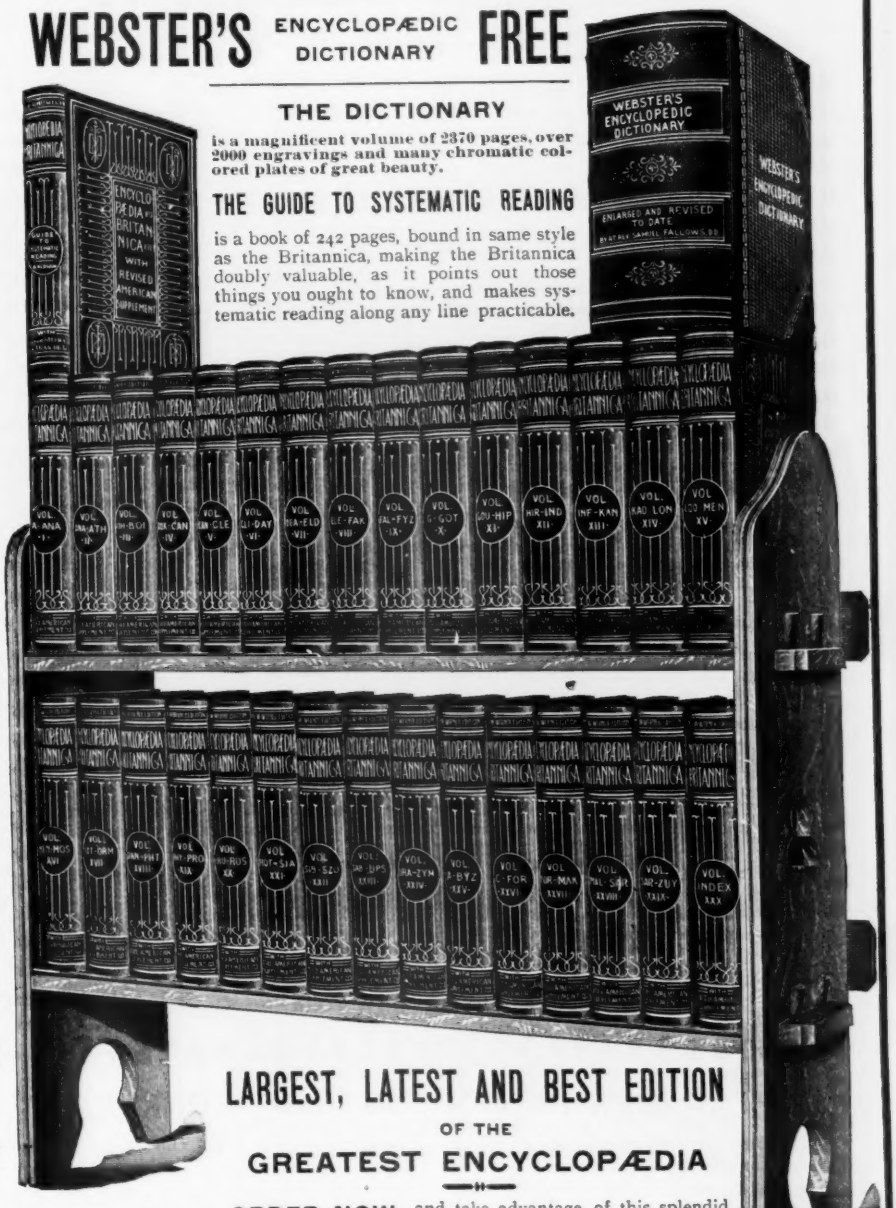


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## WOMEN IN NEW LINES OF WORK

THE ways in which women who are dependent on their own efforts make both ends meet are many and varied. Bright middle-aged women are today leaving the beaten tracks which are already well-worn by the multitude of restless younger women and are striking out for themselves. One who was forced to look for work made memorandums of what she found others doing and wrote out her experience for the New York Sun.

Among others was one who had tried in vain to make a living at millinery, in which she is an expert. She now calls at a number of houses in her neighborhood and takes the daily market orders. She is paid for this, of course, and is smart enough to get a commission besides from the butcher and the grocer. Sometimes when the mistress of the house wants something extra for a special luncheon or dinner the order-taker makes more. On one occasion a woman who had lived in Washington wanted some Lynnhaven oysters. Now it is a fact that you can't find a Lynnhaven oyster in New York such as you can get in Washington. This order-taker knew exactly how to get the Washington Lynnhavens at a reduced price, and how to have them shipped, and she made a handsome profit on her order. She would not exchange her work for a place in the biggest millinery foundry, as she called it, in New York.

Another woman buys all the theatre tickets for a colony away uptown. Her patrons call her up on the 'phone and name the date and play, and she does the rest.

Another, in addition to some other li tle jobs, furnishes several churches wi communion bread.

Then there is another who sends ou samples of new goods to customers i the country. She is not exactly a pu chasing agent, for there are many such she simply sends out the samples, nam ing the house where the goods may b obtained. The name and the address o each person receiving the samples are furnished to the house sending out th samples, and in case of a sale the woma is notified by the house, which pays her a commission. This sort of business pay better than a direct purchase by an agent—if the woman who sends the sam ples has a good list of customers, for th reason that many customers in the cou try rather like the idea of dealing wit the house direct in purchases. The stores she added, are not so apt to send sam ples as a woman who makes a business of it.

There is a woman in a drug store in a fashionable part of the city who is a graduate in pharmacy. She fills only such prescriptions as are brought in by wom en. She receives a salary, but she get a commission on all the trade she se cures from women.

★

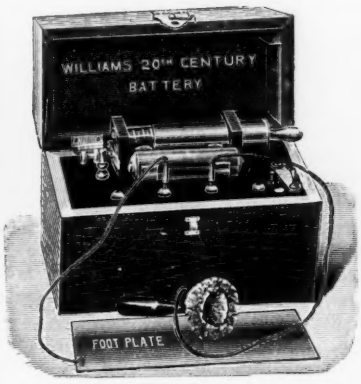
### AN ELECTRICAL TYPEWRITER

ONE of the features always striven for in the perfection of the type writer has been uniformity of impression and this has just been attained by the electrical machine which has been experimentally placed in some of the Government departments to test its efficiency. This uniformity has never before been achieved, and it is practically impossible with a bar machine, for no matter how expert the operator it is out of the question for him to impart the same blow repeatedly to the type. In the electrical typewriter the power of an electro-magnet is used to produce the impression on the paper when the key is struck. The magnet consists of a core of soft iron bent in a general horseshoe shape and the extremities wound with a great many turns of wire. When an electrical current is passed through these wires, the magnet becomes energized and attracts the armature or iron bar against the action of a spring, and in so doing actuates the lever which throws the type bar against the paper. It is apparent, therefore, that with a given source of electricity, no matter how hard or soft the blow on the keys, each type will strike the paper with the same amount of force, and the impression made will at all times be the same.

★

### SCIENCE AT WAR WITH PESTS

ALEXANDER CRAW, quarantine officer of the state board of horticulture at San Francisco, has received from Australia a consignment of tachina flies, which are expected to exterminate the grasshoppers of California. The tachinas are said to be the hereditary enemies of the 'hoppers, and are guaranteed to do no injury to trees or vines, but to devote their time and energies strictly to the purpose for which they are imported. The Australian consignment also comprises a considerable number of lady birds, which are believed to be adapted for the destruction of the red scale of orchards.

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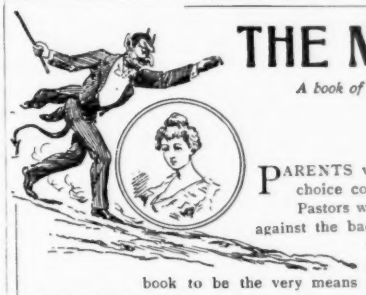

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### A MILLIONAIRE WHO DIED POOR

SAMUEL H. WARWICK was known throughout the country during the decade between 1880 and 1890. His name was associated with a brand of root beer which he made, and which was sold everywhere. In the larger cities fashionable ladies and gentlemen made engagements to meet each other and drink the refreshing beverage. It was put up to meet all kinds of trade, fine bottles and fancy corks, with tin foil covering being used to catch the high class of trade, while in less attractive style it appeared in the humble refreshment stands to be found in the small streets of the business sections, where the newsboy and messenger get rid of their spare change. As stated above, it was to be found in the smallest hamlet in the country, hardly any place being too remote for this drink to find its way, and at the same time thousands of gallons of it were shipped to Europe and South America, where it was hailed with delight. This success was not due alone to the excellence of the compound, but to the persistent and liberal advertising, and the unquestionable business methods of the "man behind the gun," Mr. Warwick.

Mr. Warwick in some way ran across a very excellent recipe for root beer, and made it for his own consumption with such success that he soon decided to go into the business, which he did in an humble way a little more than twenty years ago. The business was judiciously carried on, and the commodity properly advertised, and the traffic began at once to expand. In this it was encouraged by the fostering care of Mr. Warwick, and he soon found himself in the midst of a gigantic industry, of which he was the sole owner and proprietor.

His money accumulated very rapidly until it reached more than $1,000,000, and being a very pleasant person as well as a leading business man, a throng of distinguished and influential persons was attracted around him. He entertained lavishly, and gave away much to charity. Hundreds of persons numbered among his friends were saved in time of trouble by his help, and poor persons called to his attention were always substantially aided.

But the man who had built up a fortune for himself, and had come to the assistance of thousands of others, had not the ability or foresight to provide for his own future, and in some way his vast fortune flew from him. One by one he was deserted by his friends, and soon he found himself penniless and almost alone. Almost alone, but not quite, for there remained by him two friends whom he had helped in the days of affluence, and they took some care of the unfortunate old man in his last days. He died, however, at the age of seventy years, in a charitable institution in Philadelphia, and his body was interred in a cemetery near Camden, N. J.

★

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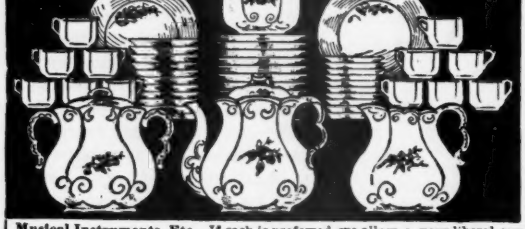

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### A SCIENTIFIC ACHIEVEMENT

AT the recent meeting of the National Academy of Sciences Professor S. P. Langley, secretary of the Smithsonian Institution, told of his discovery of the basis of heat and cold which will prove of inestimable value to forecasters of the weather. Mr. Langley began his study along this line about twenty years ago by experiments with the thermopile and with this extended the solar spectrum as known to Sir Isaac Newton. To continue his researches he invented the bolometer, an instrument which now indicates the one one-thousandth-millionth of a degree centigrade.

One day in 1882 when, being near the summit of Mount Whitney in the Sierra Nevadas, alone and at an altitude of 12,000 feet, he there with this newly invented instrument was working in this invisible spectrum. He went down the spectrum, noting the evidences of invisible heat die out on the scale of the instrument, until he came to the apparent and even of the invisible, beyond which the most prolonged researches of investigators had shown nothing up to that time. There he watched the indications grow fainter and fainter until they, too, ceased at the point where the latest French investigators had found, as they deemed, the very end of the end. By some happy thought he pushed the indicators of this delicate instrument into the region still beyond. In the still air of this lofty region the sunbeams passed unimpeded by the mists of this lower earth, and the curve of heat, which had fallen to nothing, began to rise again. There was something there, for he found, suddenly and unexpectedly, a new spectrum of great extent, wholly unknown to science and whose presence was revealed by the new instrument, the bolometer.

It afterward proved that here was the principal seat of the changes which affect the climates and the crops and agriculture.

William E. Curtis, who reported the general substance of Mr. Langley's address says that the professor presented to the Academy the first volume of the Annals of the Smithsonian Astro-Physical Observatory. It was something of not only abstract scientific interest, but gave a promise of rendering service to agriculture and to other national concerns; and the professor dismissed this long part of the work of his life with the hope that it would lead in coming years to great utilties and the protection of coming harvests founded on relations between the seasons, the crops and their great producer, the sun.

Joseph, we are told, was able to predict seven years of plenty and seven years of famine. We are still far, it is true, from being able to do this, Mr. Langley said, but it is not too much to say that these more recent studies strongly point in the direction of some coming power of prediction.

ROBERT MAXWELL has patented an interesting device which weighs no more than twenty-five pounds, and, placed on one end of the perfecting press, prints the names and addresses on the papers as they come from the press.